For Official Use **ENV/JM/HCL(99)3/PART2**

Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

OLIS :
Dist. : 21-May-1999

English text only

ENVIRONMENT DIRECTORATE
JOINT MEETING OF THE CHEMICALS COMMITTEE AND THE WORKING PARTY ON CHEMICALS

Task Force on Harmonisation of Classification and Labelling

Expert Group on Classification Criteria for Mixtures of the Task Force on Harmonisation of Classification and Labelling

REVISED DRAFT DETAILED REVIEW DOCUMENT:OVERVIEW AND COMPARISON OF EXISTING HAZARD CLASSIFICATION SYSTEMS FOR CHEMICAL MIXTURES. PART 2: ANNEXES

4th Meeting of the OECD Expert Group on Classification Criteria for Chemical Mixtures, 28th - 29th June 1999, Dublin, Ireland, beginning on 28th June at 9.30 a.m.

For Official Use
ENV/JM/HCL(99)3/PART2
English text only

DETAILED REVIEW DOCUMENT
TABLE OF CONTENTS

APPENDIX I: DEFINITIONS

TABLE 9 WORKPLACE DEFINITION OF SUBSTANCE

SYSTEM	*DEFINITION*	*LEGISLATION, REGULATORY, OTHER*
USA	Chemical means any element, chemical compound, or mixture of elements/chemical compounds. Hazardous chemical means any chemical which is a physical hazard or a health hazard.	Definitions are regulatory and can be found in 29 CFR 1910.1200(c).
EUROPE	For the purposes of placing on the market - **substances** mean chemical elements and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the products and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition. A substance may be chemically very well defined (e.g. acetone) or a complex mixture of constituents of variable composition (e.g. aromatic distillates). For some complex substances, some individual constituents have been identified. For the protection of workers from the risks related to the exposure to chemical, physical and biological agents at work - **agent** means any **chemical, physical or biological agent present at work and likely to be harmful** present at work and likely to be harmful to health. For the protection of workers from exposure to **carcinogens** the same definition is used as in the context of Directive 67/548/EEC.	The definitions are part of the legislation. Definitions for substances and preparations have been specified in • **Article 2 of Directive 67/548/EEC**. The scope of application of Directive 88/379/EEC is specified in • **Article 1 of Directive 88/379/EEC.** Chemical agents for protection of workers have been specified in • **Article 2 of Directive 80/1107/EEC** on the protection of workers from the risks related to exposure to chemical, physical and biological agents**.**
CANADA	Controlled product: Means any product material or substance specified by the regulations to be included in any of the following class: (A) compressed gas; (B) flammable and combustible material; (C) oxidizing material; (D) poisonous and infectious material; (E) corrosive material; and (F) dangerously reactive material	The definitions **can be found in the *Hazardous Products Act* and the *Controlled Products Regulations*.**
UNCETDG	No definition	

TABLE 10: WORKPLACE DEFINITION OF MIXTURE/PREPARATION		
SYSTEM	*DEFINITION*	*LEGISLATION, REGULATORY, OTHER*
USA	Mixture means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.	Definitions are regulatory and can be found in 29 CFR 1910.1200(c).
EUROPE	**I. For the purpose of placing on on the market** - preparations mean mixtures or solutions composed of two or more substances. The scope of Directive 88/379/EEC covers mixtures which contain at least one dangerous substance and the preparation is regarded as dangerous within the meaning of Article 3 of Directive 88/379/EEC.	The definitions are part of the legislation. Definitions for substances and preparations have been specified in • **Article 2 of Directive 67/548/EEC**. The scope of application of Directive 88/379/EEC is specified in • **Article 1 of Directive 88/379/EEC.** Chemical agents for protection of workers have been specified in • **Article 2 of Directive 80/1107/EEC** on the protection of workers from the risks related to exposure to chemical, physical and biological agents**.**
CANADA	Mixture [CPR 2(1)]: means a combination of two or more products, materials or substances that does not undergo a chemical change as a result of interaction between the products, materials or substances.	The definitions **can be found in the *Hazardous Products Act* and the *Controlled Products Regulations.***
UNCETDG	no definition	

APPENDIX II: EXISTING SYSTEMS

TABLE 11 WORKPLACE

System Element	U.S.	CANADA	EU	TRANSPORT SYSTEM
Regulation/law.	OSHA Hazard Communication Standard, 29 CFR 1910.1200	Yes . The legislative requirements for the Workplace Hazardous Material Information System or WHMIS are the *Controlled Products Regulations* (CPR) under the authority of the *Hazardous Product Act* (HPA).	<u>For placing on the market:</u> Directive 88/379/EEC on classification, packaging and labeling of dangerous preparations with technical adaptations and derived Directives (list of directives attached). Directive 67/548/EEC on classification, packaging and labeling of dangerous substances with 8 amendments and 23 adaptations to technical progress (list of directives attached). Directive 80/1107/EEC on the protection of workers from the risks related to exposure to chemical, physical and biological agents at work (OJ No L 327, 3.12.1980, p. 8).	UN Recommendations on the Transport of Dangerous Goods. The UN Recommendations apply to all products, whatever their end use is intended to be. Exceptions from the requirements are related to quantities carried or type of packaging used rather than to the end use.

			Directive 90/394/EEC on the protection of workers from the risks related to exposure to carcinogens at work (Sixth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) (OJ No L 196, 26.7.1990, p.1). Directive 97/42/EC amending for the first time Directive 90/394/EEC on the protection of workers from the risks related to exposure to carcinogens at work (Sixth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) (OJ No L 179, 8.7.1997, p. 4).	
Which health or environmental endpoints are covered by the system?	Carcinogens; toxic or highly toxic agents; reproductive toxins; irritants; corrosives; sensitizers; hepatotoxins; nephrotoxins; neurotoxins; agents which act on the hematopoietic system; agents which damage the lungs, skin, eyes or mucous membranes. (From definition of health hazard.)	Acute toxicity (oral and dermal LD50, LC50), Skin and eye irritation, Corrosion, Skin and respiratory sensitization, Chronic toxicity, Mutagenicity, Reproductive toxicity, Teratogenicity and Embryotoxicity, Carcinogenicity No environmental endpoints covered by WHMIS	The system specified by Directive 88/379/EEC for placing on the market covers end points for health effects. These end points are specified in detail by criteria of Annex VI to Directive 67/548/EEC on classification, packaging and labelling of dangerous substances. The end points for health effects are: 1. acute lethal effects (additivity applies): • very toxic (indicated by warning symbol T+ and R-phrases 26, 27, 28) • toxic (indicated by warning symbol T and R- phrases 23, 24, 25)	Acute toxicity and corrosivity are covered; environmental endpoints are covered separately by regulations applicable to individual modes of transport.

			• harmful (indicated by warning symbol Xn and R-phrases 20, 21, 22) 2. non-lethal irreversible effects after a single exposure; • very toxic (indicated by warning symbol T+ and R-phrase 39) • toxic (indicated by warning symbol T and R- phrase 39) • harmful (indicated by warning symbol Xn and R-phrase 40) 3. severe effects after repeated or prolonged exposure; • toxic (indicated by warning symbol T and R- phrase 48) • harmful (indicated by warning symbol Xn and R-phrase 48) 4. corrosive effects, irritant effects (additivity applies); • corrorive (indicated by warning symbol C and R-phrase 35 or 34) irritant (indicated by warning symbol Xi and R-phrases 41, 36, 37 or 38) 5. sensitising effects; • sensitisation by inhalation (indicated by warning symbol Xn and R-phrase 42) sensitisation by skin contact (indicated by warning symbol Xi and R-phrase 43)	

			6. carcinogenic effects, mutagenic effects, toxic effects for reproduction. • carcinogen category 1 or 2 (indicated by warning symbol T and R-phrases 45 or 49) • carcinogen category 3 (indicated by warning symbol Xn and R-phrase 40) • mutagen category 1 or 2 (indicated by warning symbol T and R-phrase 46) • mutagen category 3 (indicated by warning symbol Xn and R-phrase 40) • toxic for reproduction, fertility, category 1 or 2 (indicated by warning symbol T and R-phrase 60) • toxic for reproduction, fertility, category 3 (indicated by warning symbol Xn and R-phrase 62) • toxic for reproduction, development, category 1 or 2 (indicated by warning symbol T and R-phrase 61) • toxic for reproduction, development, category 3 (indicated by warning symbol Xn and R-phrase 63).	

			The end points for environmental effects are not covered by the European legislation so far. For the protection of the health of workers from exposures to chemical agents the same end points described above are considered as a minimum requirement, however, in addition to marketed substances and preparations any agent present at work and likely to be harmful to health shall be taken into consideration by the employer.	
Definition of substance/chemical.	Chemical means any element, chemical compound, or mixture of elements/chemical compounds. Once a hazard determination is performed, the standard applies to those chemicals found to be hazardous. Hazardous chemical means any chemical which is a physical hazard or a health hazard.	Controlled product: Means any product material or substance specified by the regulations to be included in any of the following class: (A) compressed gas; (B) flammable and combustible material; (C) oxidizing material; (D) poisonous and infectious material; (E) corrosive material; and (F) dangerously reactive material.	For the purposes of placing on the market **substances** mean chemical elements and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the products and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition. A substance may be chemically very	There is no definition of substance.

			well defined (e.g. acetone) or a complex mixture of constituents of variable composition (e.g. aromatic destillates). For some complex substances, some individual constituents have been identified. For the protection of workers from exposure to chemicals **agent** means any **chemical** present at work and likely to be harmful to health. For the protection of workers from exposure to **carcinogens** the same definition is used as in the context of	
Definition of mixture/preparation.	Mixture means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.	Mixture [CPR 2(1)]: means a combination of two or more products, materials or substances that does not undergo a chemical change as a result of interaction between the products, materials or substances.	Directive 67/548/EEC. For placing on the market definition for **preparations** mean mixtures or solutions composed of two or more substances. The **scope** of Directive 88/379/EEC covers mixtures which contain at least one dangerous substance and the preparation is classified according to the rules specified by Directive 88/379/EEC.	There is no definition of preparation/mixture.

Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.	Definitions are regulatory and can be found in 29 CFR 1910.1200(c).	The definitions are in the regulation and legislation.	The definitions are part of the legislation. Definitions for substances and preparations have been specified in • **Article 2 of Directive 67/548/EEC**. The scope of application of Directive 88/379/EEC is specified in • **Article 1 of Directive 88/379/EEC.** Chemical agents for protection of workers have been specified in • **Article 2 of Directive 80/1107/EEC** on the protection of workers from the risks related to exposure to chemical, physical and biological agents.	

	The chemical manufacturer, importer or employer is responsible for classifying the mixture. The appropriateness of the classification may be assessed by the Agency's enforcement personnel.	The responsibility for the classification of the mixture rests with the Canadian supplier, distributor or importing agent.	According to Article 1 of Directive 88/379/EEC the Directive is applied to classification, packaging and labeling of dangerous preparations when preparations are **placed on the market** of the Member States. The **manufacturer, or those responsible for placing on the market (importer, distributor or any other person)** shall comply with the requirements of the Directive. **The employer** has the obligation to identify the hazards and risks in the work place according to **worker protection** Directives (Directive 89/391/EEC, Directive 80/1107/EEC and Directive 90/394/EEC). The basic information on classification for this purpose is submitted via labels and Safety Data Sheets to the employer by persons placing on the market of preparations. Where a chemical is present or is produced at the work place, the employer is responsible for identification of hazards and risks.	The consignor has to certify that dangerous goods are handed over for transport are properly classified according to the transport regulations criteria, and therefore the consignor is responsible for providing the proper information. In certain instances, the classification has to be made by the appropriate competent authority (e.g., for explosives, organic peroxides, etc.)

Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?	If test data are available on the mixture as a whole, the classification is to be based on that data. Chemicals may have test data for some endpoints and not others. If there are no data for a particular endpoint, the classification for that health effect would be based on the standardized approach below.	Yes.	For placing on the market according to Article 3.3 of Directive 88/379/EEC the **test data overrule** the conventional method (based on concentrations of component substances) in cases where appropriate test data are available. This **does not apply** to cases where the preparation contains **carcinogenic, mutagenic or toxic to reproduction substances**.	Normally, when relevant test data are available, they should be used for classification of mixtures. When test data are not available, calculation methods using test data on the active ingredient may be permitted in certain cases. For details see the UN Recommendations.
Is testing obligatory? Are there any exceptions to the obligatory testing requirements?	OSHA has no authority to require testing. The hazard determination is to be based on available data.	No.	Testing is obligatory to assess the following physico-chemical properties: explosive, oxidizing, extremely flammable, highly flammable and flammable properties. There are certain exemptions from these testing requirements specified in Annex VI to Directive 67/548/EEC. Exemptions: The flammability of gas mixtures need not to be tested when produced in order of small amounts. In these cases the calculation method applies (Section 9.1 of Annex VI to Directive 67/5448/EEC).	No

			The oxidizing properties of gas mixtures which cannot be tested. The method applied for classification is based on oxidizing potential of gases compared with the oxidizing potential of oxygen in air (Section 9.1 of Annex VI to Directive 67/548/EEC). Organic peroxides which cannot be tested, are classified on the basis of a calculation method based on the presence of active oxygen (Section 9.5 of Annex VI to Directive 67/548/EEC). Testing is not obligatory for assessment of health effects of preparations. However, the person placing on the market is free to choose whether to test or to apply the conventional method. Testing shall not be used in cases where the preparation contains carcinofenic, mutagenic or toxic to reproductive substances. Testing on vertebrate is not preferred because of animal welfare reasons.	

<table>
<tr>
<td>Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.</td>
<td>No. The classification is to either be based on actual test data or on the standardized approach described below.</td>
<td>Yes. You can also use:
-Professional judgement
-Test results obtained with a product, material or substance that has similar properties.
-Human data.</td>
<td>If the preparation has been tested for placing on the market for its health effects the composition of the preparation may vary according to the following table (Article 3.3 of Directive 88/379/EEC) without having an obligation to carry out a new assessment. If the variation of concentration of constituents is greater the assessment shall be carried out again either by testing or by application of the conventional method.
Table Changes of composition of the initial concentration as a w/w percentage, of one or more of the dangerous constituents are introduced by the manufacturer
<table>
<tr><th>Initial concentration range of the constituent</th><th>Permitted variation in initial concentration of the constituent</th></tr>
<tr><td>2.5%
> 2.5 – 10%
> 10 – 25%
> 25 – 50%
> 50 – 100%</td><td>+/-15%
+/-10%
+/-6%
+/-5%
+/-2.5%</td></tr>
</table>
A new assessment (either by testing or by conventional method) shall be carried out if any of the constituents is substituted, or other components are added.</td>
<td>Yes. Classification can be done by:

analogy to substance with similar properties;

consideration of human experience.</td>
</tr>
</table>

			Potentiation, antagonism and synergism of the component substances shall be taken into consideration in the classification in cases, where application of the conventional method would not give a correct classification for the mixture. Structure activity relationship (SAR) may be applied in the assessment of mixtures only for component substances when the conventional method is applied for classification of mixtures. Application of SAR method to substances is rather limited. Advice for application of SAR is given by Annex VI to Directive 67/548/EEC.	
Please describe any standardised approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.	Where test data are not available, mixtures are assumed to have the same health hazards as do the components which comprise one percent (by weight or volume) or greater of the mixture as a whole. **Exceptions:** Mixutres are considered caracinogenic for purposes of hazard communication when they comprise 0.1% or greater of the mixture as a whole. If there is evidence that a component present in concentrations less than one percent (0.1% for	- Controlled products that are untested mixtures with respect to one or more applicable toxicological endpoints specified in the CPR must be evaluated on the basis of the hazards associated with each ingredient present at a reportable concentration in the mixture. In the case of a controlled product that is an untested mixture, the mixture is generally considered to have the same toxicological hazards as the ingredients subject to disclosure present at or above the cut-off concentrations. Reportable concentrations are 0.1% w/w or more for substances which meet the classification criteria for teratogenicity, embryotoxicity,	The *conventional method* based on the properties and concentrations of component substances of preparations may be applied for health effects in cases where no test data are available. The concentration limits of components for classification are specified either for individual substances in Annex I (list of dangerous substances) to Directive	An untested mixture is considered to have the same toxicological hazards as the ingredients. ACUTE TOXICITY If LC_{50} data is available for each of the toxic componants the LC_{50} value of the mixture can be estimated by the following formula: $$LC_{50}\ (\text{mixture}) = \frac{1}{\sum_{i=1}^{n} \frac{f_i}{LC_{50i}}}$$

	carcinogens) can be released in concentrations that would exceed OSHA's established permissible exposure limits or ACGIH's recommended exposure limits, or presents a health hazard to employees in those lower concentrations, the mixture is assumed to be hazardous for purposes of hazard communication	Carcinogenicity, reproductive toxicity, germ cell mutagenicity, or respiratory tract sensitisation. The concentration cut-off is 1% w/w for all other toxicological criteria in WHMIS (i.e. acute and chronic toxicity, somatic cell mutagenicity, skin and eye irritation, and dermal sensitisation). Acute toxicity LD_{50} or LC_{50} values Where the LD_{50} or LC_{50} of one or more ingredients of a mixture is not known, the LD_{50} or LC_{50} of the mixture is equal to the most acutely lethal ingredient that is present in the mixture at a concentration of one percent or more. Additional rule: If LD_{50} / LC_{50} values are known for each ingredient present in the mixture at $\geq$ 1% w/w, the product LD_{50} / LC_{50} may be calculated Using the following formulas: a) for a solic or a liquid $\frac{1}{LD_{50} \text{ of mixture}} = \frac{\text{Part Ingred A}}{LD_{50} \text{ Ingred A}} +$ $\frac{\text{Part Ingred B}}{LD_{50} \text{ Ingred B}} + \frac{\text{Part Last Ingred}}{LD_{50} \text{ Last Ingred}}$	67/548/EEC or in Annex I to Directive 88/379/EEC generally for different end points. Where individual concentration limits have been specified for a substance in Annex I to Directive 67/548/EEC, they have to be used. The concentration limits applied generally for different end points are specified in Annex 2. The formulas apply where the properties are considered to be additive and no single component substance alone exceeds the classification limit. (see Annex 3). The classification of preparations carried out by a person responsible for marketing can be applied by the employer, but where other chemicals are present or produced at the work place, the employer has the obligation to identify the hazards and risks.	Where f_i = mole fraction of the I^{TH} component LC_{50i} = mean lethal concentration for the I^{TH} component If LD_{50} data is not available for all components of the mixture: The formulation is classified according to the most hazardous constituent of the mixture as if that constituent were in the same concentration as the total concentration of all active components; or b) apply the formula: $\frac{C_A}{T_A} + \frac{C_B}{T_B} + \ldots + \frac{C_Z}{T_Z} = \frac{100}{T_M}$ where c = percentage concentration of constituent A, B, …, Z in the mixture; T = LD_{50} values for components A, B, …, Z;T_M = LD_{50} value of the mixture

		b) for a gas, vapour, dust, mist or fume $\frac{1}{LC_{50} \text{ of mixture}} = \frac{\text{Part Ingred A}}{LC_{50} \text{ Ingred A}} +$ $\frac{\text{Part Ingre B}}{LC_{50} \text{ Ingre B}} + \frac{\text{Part Last Ingred}}{LC_{50} \text{ Last Ingred}}$		
Please briefly describe the rationale for the standardised approach to untested mixtures.	The Hazard Communication Standard provides exposed workers and employers using a chemical in their workplaces with the right to know the identities and hazards of those chemicals. The underlying philosophy is that the availability of information allows the selection and use of appropriate control measures, thus resulting in fewer illnesses and injuries based on chemical exposures. It thus is based on the premise that as complete disclosure as possible is the best approach. This desire for disclosure was balanced by concerns about trade secret claims (which are more	• A classification system based on cut-offs presumes that a mixture is hazardous if it contains a hazardous ingredient at a concentration exceeding a specified cut-off. The use of cut-offs is administratively straightforward and can be applied by using available data on the toxicology of ingredients in the mixture. Since WHMIS is primarily an information system, the use of cut-off values is justifiable as a means of consistently communicating information about hazardous ingredients, as contrasted with providing a hazard evaluation of the mixture. • The numerical values of cutoffs, however, are necessarily arbitrary and were chosen largely for consistency between Canada and the United States.	The standardised approach, the *conventional method*, for assessment of health effects of mixtures is based on • identified classifications of component substances and • concentration limits set to identify the same classifications as for component substances. The objective of the conventional method is to discourage testing for animal welfare reasons, and to provide an easy, inexpensive and from toxicological point of view valid method for classification which offers at least the same level of protection of health as the method based on testing.	The approach is a pragmatic one, i.e., it should allow the consignor to determine, without unnecessary difficulties or costs, the hazard characteristics of the mixture (including wastes, where the exact composition is not always easy to determine) which would determine its correct identification (proper shipping name), labeling, marking and packing conditions with transport requirements.

	Common for chemicals in small concentrations) and the need for information about very small quantities. The percentage cutoffs were selected as a practical and pragmatic approach to addressing these concerns, while still ensuring that necessary information is readily available to employers and employees		A study[1] was carried out for justification of concentration limits on acute effects. The concentration limits for classification for long term effects are based on a reasonable approach taking into consideration the characteristics of the effects. Often, if data are available, individual concentration limits for classification are set for substances in Annex I to Directive 67/548/EEC For genotoxic carcinogens and mutagens normally a no-effect limit cannot be established. The conventional values of 0.1 % for category 1 and 2 carcinogens and mutagens are therefore merely set on the basis of a level of impurities and estimation of the potency of strong carcinogens. For reproductive toxic substances the values have been set taking the no-effect levels into consideration. The values of 1 % and 5 % for suspected carcinogens and mutagens, and for suspected reproductive toxic substances are established recognising the lower grade of proof that these endpoints may occur in practice.	

			For carcinogenic, mutagenic and reproductive toxic substances the establishment of specific concentration limits is more difficult. However, a system based on the potency of a carcinogenic substance is used to establish individual limits (see step 1 OECD report for carcinogenicity) in specific cases. The experience on the Community level is, however, in an early stage. The identification of toxicological end points provides the basis for the down stream legislation, like: • hazard communication by labels and Safety Data Sheets • protection of workers from the exposure to chemical agents and carcinogens, • protection of the environment from the emissions to the environment (water, air, soil)	

			• restrictions for marketing and use of dangerous substances and preparations • prevention of major accidents. Hazard communication is the immediate consequence of classification. In most cases information on the identified classifications is passed to the final user, whether it be a professional user or a consumer. Information on the names of dangerous components giving rise to the classification is passed by labels according to certain specified rules from the concentrations triggering the classification. For professional users of preparations, in addition to labels, Safety Data Sheets on classified preparations are also submitted giving even more detailed information than the labels. In the Safety Data Sheets information shall be given on components dangerous to health from 1 % on, unless the classification limit is lower. This information is intended for the employer who according to the Community legislation has the obligation to protect the workers from the exposure to chemical agents and carcinogens. The employer has to inform the workers about the potential hazards.	

	.		In the framework of downstream legislation other than hazard communication normally a risk assessment shall be carried out on the top of the hazard assessment to examine whether measures for protection of health and the environment are needed.	
How are mixtures classified when some endpoints have test data and others don't?	Classification is based on test data where available, and the endpoints where such data are not available are classified based on the standardized approach.	Test data are used when available; ingredients data are used for other toxicity endpoints that were not tested. Information relating to ingredients must be disclosed if this information is applicable to the mixture. Professional judgment can also be used.	All end points for a mixture have to be assessed on the basis of available data. Where appropriate test data exist they have a preference over the conventional method based on the concentrations of individual components, except in cases the preparation contains c/m/r-substances. The classification is carried out on the basis of test data where the test data are available for the end point. All other end points are then assessed by applying the conventional method.	Test data are used when available; ingredients data are used for other toxicity endpoints that are not tested.
Is there any other information regarding the approach to mixture classification that needs to be addressed?	As noted above, the standard includes a back-up provision to ensure that employee protection is not compromised by the percentage cutoffs. This back-up provision makes exceptions to the cutoffs when there is evidence that they don't provide sufficient protection.	Complex mixtures are exempt to disclose on a material safety data sheet the chemical identity and concentration of the ingredients if the generic name is disclosed on the material safety data sheet. Turpentine and petroleum distillates are examples of complex mixtures. A complex mixture can be comprised of a multitude of ingredients whose concentrations may vary from batch to batch. A complex mixture is classified based on its generic name rather than the		

		ingredients present in the mixture. Complex mixture means a mixture that is a combination of many chemicals, has a commonly known generic name and is : a) naturally occuring, b) a fraction of a naturally occurring mixture that results from a separation process, or c) a modification of a naturally occuring nixture or a modification of a fraction of a naturally occurring nixture that results from a chemical modification process.		
Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?	No. The system has worked quite well since adopted in 1983. Furthermore, OSHA has delayed consideration of any changes to this standard until the internationally harmonized system is available.	No.	The formal decision making process for revising the Directive 88/379/EEC on classification, packaging and labeling of dangerous preparations began in 1996 and is expected to be finalized by the end of 1998. The revision of Directive 88/379/EEC is necessary to comply with the commitments set by the Accession Treaties of Austria, Finland and Sweden. The following new elements have been introduced into the proposal:	

			Provisions for classification, packaging and labeling of preparations dangerous for the environment Pesticides will be covered by the new Directive, existing Directive 78/631/EEC will be repealed by the new Directive Explosives are brought in the scope of the Directive Some provisions of the Directive cover also preparations which are not classified as dangerous. Revision of Directive 80/1107/EEC on exposure to chemical agents is on the way. The revised Directive will likely be adopted in 1998.	No

[1] Regulatory Toxicology and Pharmacology, Vol. 4(1984), p.145-156.

Table 12: Pesticides

System Element	U.S.	Canada	EU	Transport System
Regulation/law	Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136 et seq.	Yes. However, there are no provisions per se in the Pest. Act regarding classification of mixtures. Primary consideration in classification is the use for which the pesticide is intended. Additional consideration is given to characterization of individual toxicological, environmental and packaging criteria. Mixtures are classified for domestic, commercial, or restricted use with an ascending degree of hazard associated with each class. Acute toxicity considerations are common safety criteria for assignment to all classes. Additional consideration for the domestic class include considerations of acceptable package size and methods for disposal. Additional criteria for assignment to the restricted class include consideration of environmental risk as well as whether the product is intended for use in environmentally sensitive areas (such as aquatic or forestry situations).	Directive 78/631/EEC on classification, packaging and labeling of dangerous preparations (pesticides) (OJ No L 206, 29.7.1978, p. 13) (list of directives attached). Directive 91/414/EEC on placing the plant protection products on the market (list of directives attached).	UN Recommendations on the Transport of Dangerous Goods. The UN Recommendations apply to all products, whatever their end use is intended to be. Exceptions from the requirements are related to quantities carried or type of packaging used rather than to the end use

Which health or environmental endpoints are covered by the system?	Acute toxicity (oral, inhalation, dermal), skin irritation, eye irritation, sensitization, and toxicity to fish and wildlife and pollinating insects. In addition, some pesticides have been labeled for carcinogenicity and reproductive effects. EPA has the authority to regulate pesticides for any health or environmental endpoint.	Acute oral, dermal, inhalation toxicity, skin and eye irritation, skin sensitization. Acute neurotoxicity studies are required for products for which effects on the nervous system are anticipated due to chemical class or other information.	The system specified by Directive 78/631/EEC on classification, packaging and labeling of dangerous preparations (pesticides) covers end points for acute health effects. The endpoints specified by Directive 78/631/EEC are: 1) acute lethal effects (calculation and adaptivity may apply): I. very toxic by ingestion, inhalation or percutaneous route II. toxic by ingestion, inhalation or percutaneous route III. harmful by ingestion, inhalation or percutaneous route 2) additional toxicological data may be taken into consideration in classification if : II. the facts suggest that in normal use of a pesticide involves a risk to human health III. it is shown that other than rat is more suitable test species IV. oral or percutaneous LD50-values should not be used as a basis of classification.	Acute toxicity and corrosivity are covered; environmental endpoints are covered separately by regulations applicable to individual modes of transport.

			The acute oral and dermal toxicity has been specified separately for solids and liquids. The cut-off limits for acute toxicity are different from the cut-off limits for general chemicals (see Annex 1 to this document). The end points for other health effects are not specified in detail by the European legislation for the time being. The environmental effects are not covered by Directive 78/631/EEC. Although the detailed criteria for classification of Directive 78/631/EEC cover only acute lethal effects the labeling requirements indicate that other end points may be taken into consideration (reference to Directive 67/548/EEC is made).	
Definition of substance/chemical.	Neither substance/chemical nor mixture are defined. See below for other definitions that apply.	**Substances**: chemical elements/entitles and their constituents, as they occur in the natural state or produced by industry. Eg. Technical grade active ingredients including impurities/contaminants resulting from the manufacturing process; can be further utilized in preparations Eg. Chemical soups, such as creosote; may also be utilized in preparations	For placing on the market the term of **II.** **active substances** is used within Directive 78/631/EEC on classification, packaging and labeling of dangerous preparations without definition. **III.** **active substances** according to Directive 91/414/EEC (on placing plant protection products on the market) mean substances or micro-organisms including viruses, having general or specific action	There is no definition of substance.

			IV. **substances** according to Directive 91/414/EEC (on placing plant protection products on the market) mean chemical elements and their compounds, as they occur naturally or by manufacture, including any impurity inevitable resulting from the manufacturing process.	
Definition of mixture/preparation.	N/A	**Preparation**: a mixture or solution composed of two or more substances*; the mixture is not known to, or is not expected to chemically react (irreversibly) with each other to form other chemical entities. e.g. End-use formulations (market-ready) e.g. Manufacturing use concentrates; these products may subsequently be formulated into preparations e.g. 2,4-D dimethylamine salt preparation resulting from the combining of 2,4-D acid, dimethylamine and water; although representing a chemical reaction, the reaction is easily reversible by manipulation of pH * at least one of which is a pesticidal active ingredient -otherwise would not be subject to PCPA	For placing on the market of pesticides the term of a **II.** **mixture/preparation** is used within Directive 78/631/EEC on classification, packaging and labeling of dangerous preparations without definition. **III.** **preparations** according to Directive 91/414/EEC (on placing plant protection products on the market) mean mixtures or solutions composed of two or more substances of which at least one is an active substance intended for use as plant protection products.	There is no definition of preparation/ mixture.
Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.	N/A	No. There are no definitions in regulation or legislation. The above definitions have been developed to reflect the working practice.	For placing on the market definitions of substances and preparations are presented in II. **Article 2 of Directive 91/414/EEC** on placing the plant protection products on the market.	

Who is responsible for the classification of the mixture?	All pesticides and pesticide products are classified by EPA's Office of Pesticide Programs, using data and information provided by pesticide registrants.	Not sure if this question refers to the legislative authority - if so, it would be the Pest Control Products Act, although as indicated above, there are no provisions, per se, in the Act.	According to Article 6.3 of Directive 78/631/EEC on classification, packaging and labeling of pesticides, the indications of special risks for the pesticides which are subject to authorization shall be specified by the **competent authority**. This specification of classification and labeling is carried out in the context of authorization, following the submission of an application. The application contains all the data needed for classification and normally a proposal of the applicant for the classification.	The consignor has to certify that dangerous goods are handed over for transport are properly classified according to the transport regulations criteria, and therefore the consignor is responsible for providing the proper information. In certain instances, the classification has to be made by the appropriate competent authority (e.g., for explosives, organic peroxides, etc.)
Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?	Available test data are used to classify mixtures.	Yes. Please consider the answer to this question together with those for the next three questions.	Test data are used as a basis of classification, and in most cases tests are required for identification of hazards of pesticide preparations **for marketing** purposes. Exceptions may be considered case by case in the context of national authorizations. Little or no experience is yet available on the application of Directive 91/414/EEC on	Normally, when relevant test data are available, they should be used for classification of mixtures.

			authorization of plant protection products on the Community level as the transitional period for entering into force of Directive 91/414/EEC has not yet expired.	When test data are not available, calculation methods using test data on the active ingredient may be permitted in certain cases. For details see the UN Recommendations
Is testing obligatory? Are there any exceptions to the obligatory testing requirements?	Health and safety data are required to be submitted by applicants for pesticide registrations. The Agency has promulgated regulations under 40 CFR Part 158 describing the data and the fact that data required for characterization of pesticides as acutely hazardous to humans are to be developed and submitted for each active ingredient and each pesticide product. Studies for chronic health hazards are performed on the active ingredient, and studies for aquatic hazards are performed on the active ingredient or typical products. The choice of typical product for aquatic testing involves expert judgement about substantial similarity of products, but obviates the need to test every product for these endpoints.	Yes. Acute toxicity testing (i.e. acute oral, dermal, inhalation toxicity, skin and eye irritation, skin sensitization and in some cases acute neurotoxicity) is required to support registration of preparations. Waivers for testing are considered on a case-by-case basis on the basis of known characteristics of the components (e.g., irritative properties), physical form (e.g., waxy or gummy resins not representing an inhalation hazard), or other scientifically sound information (see also next question).	Directive 91/414/EEC on placing the plant protection products on the market sets requirements for testing of products for authorization purposes. These test results are used for classification of individual products. The calculation method may be applicable in the case of acute lethal effects. According to Article 3.4 of Directive 78/631/EEC, if facts appear which leave the correctness of the classification on the basis of the calculation method open to doubt, the competent authorities may require that the calculation be replaced by toxicological tests.	No.

Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.	EPA accepts bridging data to characterize substantially similar products for acute human hazards. If the Agency determines that a product (pesticide active ingredient and at least one inert ingredient) is substantially similar to a registered product, experimental data may not be needed to characterize all or any of the acute hazards of the similar product.	Yes. A hazard may be predicted on the basis of available information on one or several of the constituents, e.g., in some cases involving ingredients of known sensitization, irritative/corrosive properties, pH extremes (acidity or alkalinity), other test data for similar mixtures (respecting proprietary rights to data), See also next question.	According to Article 3.2 of Directive 78/631/EEC, instead of determination of toxicological properties a pesticide containing one active substance may be classified by means of a calculation, if it is shown that the composition of a pesticide closely resembles that of another pesticide which has already been classified and the toxicological data relating to the latter are sufficiently well established. In such cases there must be valid grounds for assuming that the classification resulting from a calculation would not vary substantially from those obtainable by biological testing in accordance with paragraph 1.	Yes. Acute LD_{50} values for mixtures. The formulation is classified according to the most hazardous constituent of the mixture.
Please describe any standardized approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.	N/A	There are no standardized approaches, per se, when test data are not available such as the use of formulae or percentage cutoffs. Each is considered on a case-by- case basis. See also above responses.	*A calculation method* based on acute toxicity values of active substances and concentrations of component substances in preparations may be applied for classification of pesticides in certain cases. The calculation method is presented in Annexes 4 and 5.	No
Please briefly describe the rationale for the standardized approach to untested mixtures.	N/A	Not applicable	The objective of the classification of pesticides is to assess the toxicological end points of pesticide preparations. Testing requirements for classification are specified for authorization by Directive 91/414/EEC (or by Directive on Biocides) or by national provisions. The criteria for classification are specified only for acute effects, for which also *a calculation method* is available. The calculation method is intended to assess the	The approach is a pragmatic one, i.e., it should allow the consignor to determine, without unnecessary difficulties or costs, the hazard characteristics of the mixture

			acute toxicity equally with the test methods.	(including wastes, where the exact composition is not always easy to determine) which would determine its correct identification (proper shipping name), labeling, marking and packing conditions with transport requirements.
How are mixtures classified when some endpoints have test data and others don't?	As described above, the pesticide registrant generally has an obligation to test for all acute human hazard endpoints subject to hazard labeling. Data for other endpoints are based on the intended use pattern.	See responses above	Directive 91/414/EEC sets the requirements for placing plant protection products on the market. This Directive specifies the testing requirements to assess the hazards. The calculation method can be used for classification on the basis of acute lethal toxicity.	See responses above.
Is there any other information regarding the approach to mixture classification that needs to be addressed?	The technical grade of the active ingredient is the form that is tested for hazard potential. Most technical grade chemicals have residual impurities which are fully identified to the Agency. If the impurity profile changes significantly from one product to another, the agency may require testing.	The above responses reflect the PMRA definition of classification as pertaining primarily to market classes. This definition may not be consistent with other regulatory agencies.		

Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?	No.	Agreement on the definition of mixture will be required to establish a common basis for development of classification criteria. In addition, discussions of the scope of application of the criteria and subsequent labeling may have an impact. The degree to which harmonization may constitute disharmony within national authorities (ie. the impact on regulatory sectors within each national body) may also have an impact.	A new Directive on Biocides (non-agricultural pesticides) was adopted on 14th January 1998. This Directive specifies conditions for authorization of Biocides on the market. Directive 88/379/EEC will be applied to classification, packaging and labeling of Biocides. When the new Directive on dangerous preparations is adopted that Directive will be applicable to Biocides.	

Table 13: Consumer Products

System Element	U.S.	Canada	EU	Transport System
Regulation/law.	Federal Hazardous Substances Act 15 USC 1261 et seq. and regulations 16 CFR 1500 et seq.	Yes. New regulations are being currently drafted (CCCR).	The same provisions apply as for placing on the market of preparations intended for professional users.	Recommendations on the Transport of Dangerous Goods. The UN Recommendations apply to all products, whatever their end use is intended to be. Exceptions from the requirements are related to quantities carried or type of packaging used rather than to the end use
Which health or environmental endpoints are covered by the system?	Acute oral, dermal and inhalation toxicity; eye and skin irritation and corrosion; sensitization, carcinogenicity (including mutagenicity and germ cell mutagenicity), reproductive toxicity, neurotoxicity, and other organ toxicity.	Acute toxicity endpoints (LD50, skin and eye irritation, corrosivity).	The same provisions apply as for placing on the market of preparations intended for professional users.	Acute toxicity and corrosivity are covered; environmental endpoints are covered separately by regulations applicable to individual modes of transport.
Definition of substance/chemical.	Any substance or mixture of substances which is toxic, corrosive, an irritant, a strong sensitizer, flammable or combustible, or generates pressure through decomposition, heat, or other means, if such substance or mixture of substances may cause substantial personal injury or substantial illness during or as a proximate result of any customary or reasonably foreseeable handling or use, including reasonably fore-seeable ingestion by children.16 CFR 1500.3	No.	The same definitions are used for placing on the market of preparations for consumer uses as for workplace uses.	There is no definition of substance.

Definition of mixture/preparation.	16 CFR 1500.3 (above)	mixture: means a combination of two or more products, materials or substances that do not undergo a chemical change as a result of their interaction.	The same definitions are used for placing on the market of preparations for consumer uses as for workplace uses.	There is no definition of preparation/mixture.
Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.	Statute and regulations 15 USC 1261 et seq. and regulations 16 CFR 1500 et seq.	The definition appears in the proposed legislation	The same definitions for placing on the market apply to consumer products as to products intended for workplace uses.	
Who is responsible for the classification of the mixture?	Primarily manufacturer, importer or distributor and the agency monitors compliance	The manufacturer or importer is responsible for the classification of the mixture.	The provisions apply to consumer products as to products intended for workplace use.	The consignor has to certify that dangerous goods are handed over for transport are properly classified according to the transport regulations criteria, and therefore the consignor is responsible for providing the proper information. In certain instances, the classification has to be made by the appropriate competent authority (e.g., for explosives, organic peroxides, etc.)

Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?	Test data, if available on the mixture are used as the basis for classification of the mixture. Human experience takes precedence and there are certain circumstances when chemical composition is sufficient to classify and label.	Yes.	The same provisions apply to consumer products as to products intended for workplace use.	Normally, when relevant test data are available, they should be used for classification of mixtures. When test data are not available, calculation methods using test data on the active ingredient may be permitted in certain cases. For details see the UN Recommendations.
Is testing obligatory? Are there any exceptions to the obligatory testing requirements?	Testing in animals is not obligatory, one can use published data, past experience on similar products, human experience or an expert opinion. The manufacturer has the responsibility not to over or under estimate the hazard	No.	The same provisions apply to consumer products as to products intended for workplace uses.	No
Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.	Yes, one can use all available information to determine the right classification by SAR, extrapolation, estimation or human experience. One should not over or under classify.	Professional judgement can be used.	The same provisions apply to consumer products as to products intended for workplace use.	
Please describe any standardized approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.	N/A	- You can evaluate and classified the hazards of the mixture based on the properties and concentrations of components. - For Acute Toxicity - *Additivity Formulas* The use of additivity formulas are to be considered acceptable in the absence of expertise or data on the complete formulation. The formulas are:	The same provisions are applied to consumer products as to products intended for workplace use.	The same provisions apply to consumer products as to other Dangerous Goods.

		a) for a solid or a liquid $\frac{1}{LD_{50}\ \text{mixture}} =$ Part Ingredient A / LD_{50} Ingredient A + Part Ingredient B / LD_{50} Ingredient B + Part Last Ingredient / LD_{50} Last Ingredient b) for a gas, vapour, dust, mist or fume $\frac{1}{LC_{50}\ \text{mixture}} =$ Part Ingredient A / LC_{50} Ingredient A + Part Ingredient B / LC_{50} Ingredient B + Part Last Ingredient / LC_{50} Last Ingredient (part = the weight of the ingredient divided by the weight of the mixture); - Percentage cut-offs are used for some chemicals, as specified in Annex 1.		

Please briefly describe the rationale for the standardised approach to untested mixtures.	N/A	Additional Rationale:- *Components of Unknown Toxicity* The additivity formula can be adapted to situations where information about the LD_{50} or LC_{50} of a component of a mixture is limited or not available. Some of these situations are the following: 1) LD_{50} or LC_{50} has been estimated in an alternative test, such as the Fixed Dose Method. The LD_{50} or LC_{50} is known to exceed one of the fixed doses. The calculation can be performed as an inequality. For example, component A (40%) has LD_{50} = 300 mg/kg and component B (60%) has LD_{50} 2000 mg/kg. $1/LD_{50} = 0.4/300 + 0.6/(\geq 2000)$ $= 0.00133 + 0.00035$ $= 0.00168$ $LD_{50} = 595$ mg/kg	The same rational applies to consumer products as to products intended for workplace use.	The approach is a pragmatic one, i.e., it should allow the consignor to determine, without unnecessary difficulties or costs, the hazard characteristics of the mixture (including wastes, where the exact composition is not always easy to determine) which would determine its correct identification (proper shipping name), labeling, marking and packing conditions with transport requirements.

		2) The LD_{50} or LC_{50} can be estimated by comparison to similar substances. By professional judgement it is often possible to estimate that the LD_{50} or LC_{50} exceeds a certain value. For example, if the known LC_{50}'s of several members of a family of solvents all exceed 6000 ppm, then one may judge that an untested member of the family with similar properties has an LC_{50} exceeding 6000 ppm. This value can be used in the formula as in the above example. 3) Testing shows that serious non-lethal effects occur at a significantly lower dose than the LD_{50}. By professional judgement, the lower dose could be substituted into the formula. 4)The LD_{50} or LC_{50} is unknown and cannot be estimated. Two alternatives to deal with this situation were considered:		

		i) Whole Product Premise: In the Controlled Products Regulations (WHMIS), if no information is available about a component present at over 1%, then the LD_{50} or LC_{50} of the product is taken to be the LD_{50} or LC_{50} of the most toxic known component over 1%. This approach tends to over-classify the majority of mixtures in order to avoid the occasional under-classification. ii) Untested Component Premise: The recommended alternative is to assume that the LD_{50} or LC_{50} of the untested component is equal to the LD_{50} or LC_{50} of the most toxic component present in the mixture at a concentration of 1% or more. This avoids extreme over-classifications at the cost of more frequent under-classification. For example, a product consists of components A (10%, LD_{50} unknown), B (10%, LD_{50} = 200 mg/kg) and water (80%). In WHMIS, the assumed LD_{50} of the product is 200 mg/kg, whereas in the recommended approach, the LD_{50} is calculated to be 1000 mg/kg.		

		It should rarely occur that the toxicity of a major component of a consumer product is completely unknown. Normally it is possible to use professional judgement and qualitative and quantitative structure-activity relations (SARs) to estimate the toxicity of a material, however approximately. Nevertheless, many dealers may lack the expertise, resources or confidence to make estimates.		
How are mixtures classified when some endpoints have test data and others don't?	For some end points such as eye irritation/corrosion one may use skin irritation/corrosion data, if appropriate. For others may use published data, past experience, and expert opinion.	Test data are used when available; ingredients data are used for other toxicity endpoints that were not tested..	The same provisions apply to consumer products as to products intended for workplace use.	
Is there any other information regarding the approach to mixture classification that needs to be addressed?	The primary objective is to determine the hazard posed by the product for non-chronic end points and risk posed by the product for chronic hazards. While there is no standardized approach that applies across the board, formulae from the scientific literature may be used to predict the hazard when data permit. The manufacturer or the agency provides the rationale for the formula used.			

Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?	No	New regulations are being currently drafted.	The same provisions apply to consumer products as to products intended for workplace use.	No

Table 14: Cosmetics

System	U.S.	Canada	EU	Transport System
Regulation/law.	Regulation of cosmetics in the United States does not include hazard classification and labeling such as that being addressed in this process. Cosmetics produced or distributed for retail sale to consumers for their personal care are required to bear a full declaration of ingredients (21 CFR 701.3). See note below.	Yes. There are no provisions for classification of mixtures. Cosmetics are not classified.	<u>For placing on the market of cosmetic products:</u> Directive 76/768/EEC on cosmetic products with 6 amendments and 22 adaptations to technical progress (list of directives attached) known as the Cosmetics Directive. There is no requirement for hazard communication and labelling such as is being considered in this process. Recently, (6th Amendment to the Cosmetic Products Directive) a requirement has been introduced for ingredient labelling. <u>For protection of workers:</u> the same legislation as applicable to all chemicals (as it refers to handling of chemical raw materials).	Recommendations on the Transport of Dangerous Goods. The UN Recommendations apply to all products, whatever their end use is intended to be. Exceptions from the requirements are related to quantities carried or type of packaging used rather than to the end use
Which health or environmental endpoints are covered by the system?			The system controlling cosmetic products is different from the system that controls chemicals. The Cosmetics Directive requires that a cosmetic product put on the market be safe when applied under normal or reasonably foreseeable conditions of use. The safety of cosmetic products is evaluated based on risk, before they are placed on the market. Cosmetic ingredients are covered by the chemical legislation (the	Acute toxicity and corrosivity are covered; environmental endpoints are covered separately by regulations applicable to individual modes of transport.

			Dangerous Substances Directive, the Existing Chemicals Reg., etc.) but are subject to risk assessment - as opposed to hazard evaluation - when added to a cosmetic product (risk = hazard x exposure). For cosmetic ingredients on the annexes of the Cosmetics Directive, the same endpoints are taken into account as for chemicals when carrying out the risk assessment.	
Definition of substance/chemical.			A cosmetic ingredient is any chemical substance or preparation of synthetic or natural origin used in the composition of cosmetic products.	There is no definition of substance.
Definition of mixture/preparation.			A cosmetic product is defined in the Cosmetics Directive, Art.1: any substance or preparation intended to be placed in contact with various external parts of the human body (epidermis, hair system, nails, lips and external genital organs) or with the teeth and the mucous membranes of the oral cavity with a view exclusively or mainly to cleaning them, perfuming them, changing their appearance and/or correcting body odours and/or protecting them or keeping them in good condition.	There is no definition of preparation/mixture.
Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.			Definition of a cosmetic product is specified by Directive 76/768/EEC.	

Who is responsible for the classification of the mixture?			There is no classification system for cosmetic products. The person placing cosmetic products on the EU market is responsible for ensuring that cosmetics do not cause damage to human health when applied under normal or reasonably foreseeable conditions of use (Article 2 of the Cosmetics Directive). The Cosmetics Directive also requires that for each product the person responsible for placing it on the market has to keep a Product Information which includes a safety assessment that is based on the toxicological profile of ingredients, their chemical structure and their level of exposure. In addition, a series of cosmetic ingredients is controlled through: - a negative list (Annex II) - a restrictive list (Annex III) - 3 positive lists (Annexes IV, VI and VII). Addition of a substance to a positive/restrictive list is based on the submission of a comprehensive safety file that is examined by SCCNFP. Where appropriate, warnings for use (which have to be printed on the finished product's label) are given in the annexes.	The consignor has to certify that dangerous goods are handed over for transport are properly classified according to the transport regulations criteria, and therefore the consignor is responsible for providing the proper information. In certain instances, the classification has to be made by the appropriate competent authority (e.g., for explosives, organic peroxides, etc.)
Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?			Not applicable as there is no classification of cosmetic products**.**	

Is testing obligatory? Are there any exceptions to the obligatory testing requirements?		No.	There are no obligatory testing requirements for cosmetic products. However, the Cosmetics Directive requires that a safety assessment be carried out for each cosmetic product, based on risk. Guidelines are available on the tests that are to be carried out for the safety assessment.	
Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.			Not applicable to cosmetic products (mixtures), only to cosmetic ingredients (chemicals).	
Please describe any standardized approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.			There is no standardized approach for classifying cosmetic products.	
Please briefly describe the rationale for the standardized approach to untested mixtures.			No standardized approach exists on cosmetic products.	
How are mixtures classified when some endpoints have test data and others don't?			No standardised approach exists for classification of cosmetic products.	

Is there any other information regarding the approach to mixture classification that needs to be addressed?			No	
Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?			There is no pending or future work on classification of cosmetic products. However, efforts are in progress between many countries/economic blocks around the world for the international harmonization of cosmetic regulations. This is one more reason why cosmetics should be excluded from the project on global harmonization of hazard classification.	

APPENDIX III: RATIONALE

TABLE 15 RATIONALE FOR WORKPLACE SYSTEMS	
SYSTEM	*RATIONALE*
USA	The Hazard Communication Standard provides exposed workers and employers using a chemical in their workplaces with the right to know the identities and hazards of those chemicals. The underlying philosophy is that the availability of information allows the selection and use of appropriate control measures, thus resulting in fewer illnesses and injuries based on chemical exposures. It thus is based on the premise that as complete disclosure as possible is the best approach. This desire for disclosure was balanced by concerns about trade secret claims (which are more common for chemicals in small concentrations) and the need for information about very small quantities. The percentage cutoffs were selected as a practical and pragmatic approach to addressing these concerns, while still ensuring that necessary information is readily available to employers and employees.
EUROPE	The standarised approach, the *conventional method*, for assessment of health effects of mixtures is based on - identified classifications of component substances and - concentration limits set to identify the same classifications as for component substances.
	The objective of the conventional method is to discourage testing for animal welfare reasons, and to provide an easy, inexpensive and from toxicological point of view valid method for classification which offers at least the same level of protection of health as the method based on testing.
	A study[1] was carried out for justification of concentration limits on acute effects. The concentration limits for classification for long term effects are based on a reasonable approach taking into consideration the characteristics of the effects.
	Often, if data are available, individual concentration limits for classification are set for substances in Annex I to Directive 67/548/EEC.

Regulatory Toxicology and Pharmacology, Vol 4 (1984), p. 145 - 156.

	For genotoxic carcinogens and mutagens normally a no-effect limit cannot be established. The conventional values of 0,1 % for category 1 and 2 carcinogens and mutagens are therefore merely set on the basis of a level of impurities and estimation of the potency of strong carcinogens.
	For reproductive toxic substances the values have been set taking the no-effect levels into consideration. The values of 1 % and 5 % for suspected carcinogens and mutagens, and for suspected reproductive toxic substances are established recognizing the lower grade of proof that these endpoints may occur in practice.
	For carcinogenic, mutagenic and reproductive toxic substances the establishment of specific concentration limits is more difficult. However, a system based on the potency of a carcinogenic substance is used to establish individual limits (see step 1 OECD report for carcinogenicity) in specific cases. The experience on the Community level is, however, in an early stage.
	The identification of toxicological end points provides the basis for the down stream legislation, like: • hazard communication by labels and Safety Data Sheets • protection of workers from the exposure to chemical agents and carcinogens, • protection of the environment from the emissions to the environment (water, air, soil) • restrictions for marketing and use of dangerous substances and preparations
	• prevention of major accidents. Hazard communication is the immediate consequence of classification. In most cases information on the identified classifications is passed to the final user, whether it be a professional user or a consumer. Information on the names of dangerous components giving rise to the classification is passed by labels according to certain specified rules from the concentrations triggering the classification.
	For professional users of preparations, in addition to labels, Safety Data Sheets on classified preparations are also submitted giving even more detailed information than the labels. In the Safety Data Sheets information shall be given on components dangerous to health from 1 % on, unless the classification limit is lower. This information is intended for the employer who according to the Community legislation has the obligation to protect the workers from the exposure to chemical agents and carcinogens. The employer has to inform the workers about the potential hazards.

	In the framework of downstream legislation other than hazard communication normally a risk assessment shall be carried out on the top of the hazard assessment to examine whether measures for protection of health and the environment are needed.
CANADA	A classification system based on cut-offs presumes that a mixture is hazardous if it contains a hazardous ingredient at a concentration exceeding a specified cut-off. The use of cut-offs is administratively straightforward and can be applied by using available data on the toxicology of ingredients in the mixture. Since WHMIS is primarily an information system, the use of cut-off values is justifiable as a means of consistently communicating information about hazardous ingredients, as contrasted with providing a hazard evaluation of the mixture. The numerical values of cut-offs, however, are necessarily arbitrary and were chosen largely for consistency between Canada and the United States.
UNCETDG	The UNCETDG regulations cover all products, whatever their end use is intended to be. Exceptions from the regulations are related to quantities carried or type of packaging used rather than to the end use. The UNCETDG approach to mixtures is a pragmatic one, i.e., it should allow the consignor to determine, without unnecessary difficulties or costs, the hazard characteristics of the mixture (including wastes, where the exact composition is not always easy to determine) which would determine its correct identification (proper shipping name), labeling, marking and packing conditions in accordance with transport requirements. Adoption of the UN Recommendations in national regulations for the transport of dangerous good is intended to address safety concerns, to facilitate the transport of products and to provide a uniform global system which minimizes or eliminates discrepancies among jurisdictions and transport modes. Classification under this system provides specific requirements for packaging container size, type, labeling and specific recommendations for substance or categories

APPENDIX IV: OTHER SYSTEMS

AUSTRALIA					
System Element	**Workplace**	**Pesticides**	**Consumer Products**	**Cosmetics**	**Other**
Regulation/law.	The National Occupational Health and Safety Commission's *Approved Criteria for Classifying Hazardous Substances* [1008(1994)] is the national standard for the classification in the workplace of hazardous substances, including mixtures. National standards are advisory becoming law after adoption by Australian Commonwealth, State, or Territory governments. Industrial Chemicals (Notification and Assessment Act) 1989 and Amendment Bill 1997. This bill governs notifications and assessment of new industrial chemicals in the Australian workplace.	The registration of end use products (EUPs) containing pesticides is by the *Agricultural and Veterinary Chemicals Code Act, the Agricultural and Veterinary Chemicals Regulation Act and the Agricultural and Veterinary Chemicals Administration Act.* There are controls on the access to chemicals in poisons legislation of the separate States of Australia, and there are also State controls on packaging and labelling.			
Which health or environmental endpoints are covered by the system?	Health effect endpoints are subdivided into: • acute lethal effects; • corrosivity • irritancy a) oral b) dermal c) inhalation • sensitisation; • carcinogenicity; • mutagenicity; • reproductive toxicity. Positive results to many of these endpoints is the basis for classification into the following categories: a) very toxic b) toxic c) harmful	In the health consideration of a chemical, there is consideration of all acute endpoints, as well as short-term repeat dose, subchronic, chronic, reproduction and development effects, genotoxicity and special studies (including any human poisoning incidents). Endpoints are considered on a case-by-case basis, particularly for long-term studies. A weight-of-evidence approach is used for regulatory decisions. Any evidence of abnormality (including neurotoxicity and immunotoxicity) is considered in the determination of the regulation of a chemical. Data is supplied on all endpoints for the active constituent in a pesticide. The only information generally supplied for a product (or mixture) is information relating to the acute toxicity of the mixture.			

Definition of substance/ chemical.	**Substance:** any natural or artificial entity, composite material, mixture or formulation, other than an article. **Chemical:** any element compound or complex present as an entity or contained in a mixture.	**Definition of substance/chemical and definition of mixture/preparation.** The following definitions are present in *The Agricultural and Veterinary Chemicals Code Act, 1994*. In addition, there are working definitions which apply in the assessment of chemicals. A chemical is generally considered to be the active constituent, while the product which is to be registered is generally considered a mixture, since it normally contains active constituents and excipients or non-actives. An "agricultural chemical product" is defined as a: Substance or mixture of substances that is represented, imported, manufactured, supplied or used as a means of directly or indirectly: (a) destroying, stupefying, repelling, inhibiting the feeding of, or preventing infestation by or attacks of, any pest in relation to a plant, a place or a thing; or (b) destroying a plant; or (c) modifying the physiology of a plant or pest so as to alter its natural development, productivity, quality or reproductive capacity; or (d) modifying an effect of another agricultural chemical product; or (e) attracting a pest for the purposes of destroying it. An "agricultural chemical product" does not include: (a) a veterinary chemical product; (b) a substance or mixture of substances declared by the regulations not to be an agricultural chemical product. A "veterinary chemical product" is defined as: a substance or mixture of substances that is represented as being suitable for, or is			

		manufactured, supplied or used for, administration or application to an animal by any means, or consumption by an animal, as a way of directly or indirectly: (a) preventing, diagnosing, curing or alleviating a disease or condition in the animal or an infestation of the animal by a pest; or (b) curing or alleviating an injury suffered by the animal; or (c) modifying the physiology of the animal: (i) so as to alter its natural development, productivity, quality or reproductive capacity; or (ii) so as to make it more manageable; or (d) modifying the effect of another veterinary chemical product. A veterinary chemical product does not include: (a) a substance or mixture of substances that is: (i) prepared by a pharmacist in accordance with the instructions of a veterinary surgeon; or (ii) prepared by a veterinary surgeon; in the course of the practice, by the person preparing the substance or mixture of substance, of his or her profession as permitted by or under a law of this jurisdiction; or (b) a substance or mixture of substances declared by the regulations not to be a veterinary chemical product. All 'active constituents' used in agricultural or veterinary chemical products must be approved prior to use.			
Definition of mixture/ preparation.	**Mixture:** a physical combination of chemicals resulting from the deliberate mixing of those chemicals or from a chemical reaction.	**See above**			

Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.	These are definitions are from the National Commission's *Approved Criteria for Classifying Hazardous Substances* [1008(1994)] or the Industrial Chemicals (Notification and Assessment Act) 1989 and Amendment Bill 1997				
Who is responsible for the classification of the mixture?	The responsibility for determining whether a substance is hazardous and for identifying its health hazards belongs to the manufacturer or importer. New industrial chemicals are assessed by the National Occupational Health and Safety Commission as individual isolated chemicals except where isolation is unfeasible because of the nature of production and/or use of the chemical.	The National Drugs and Poisons Scheduling Committee (NDPSC) recommends which Schedule the pesticide is to be placed in. This Committee is established under the auspices of the Australian Health Ministers' Advisory council, and decisions are based on the evaluation carded out in the Chemicals Unit of the TGA, within the Department of Health and Family Services. Recommendations contained in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) are published with a view to promoting uniform scheduling of substances and uniform labelling and packaging requirements throughout Australia. It has no legal standing other than that given to it by relevant legislation. Mixtures of AgVet chemicals are not necessarily classified separately from their components. An AgVet chemical product which contains one or more actives or non-actives, which are classified by the NDPSC as scheduled poisons assume the poisons schedule classification of the most toxic ingredient, unless exemptions or cut-offs are applied to low concentrations (as often happens). While particular combinations of substances in therapeutic goods (eg combination analgesics) for human use may have a poisons schedule allocated on the basis of the specific hazards of that combination, this approach is extremely rare for AgVet chemical combination products. Where individual AgVet products are combined as mixtures during use (eg in tank mixtures), there is			

		no formal mechanism for classifying the hazard of such combinations.			
Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?	Data is used from mixtures tested as a whole or not tested as a whole. For those not tested as a whole each ingredient in the mixture is considered separately against the health effects criteria.	Where available, test data on the mixture are used for classification, with information assessed on the active constituent used to determine long term hazards relating to the use of the product. Where no information is available on the mixture, extrapolations are made based on the assessment of individual components of the formulation.			
Is testing obligatory? Are there any exceptions to the obligatory testing requirements?	Not obligatory for mixtures	Testing of active constituents is required prior to approval of that source of active and product registration. The data required must cover acute, short-term, sub-chronic and long-term toxicity studies, and investigations of reproductive and development toxicity, genotoxicity, carcinogenicity and other toxicology studies. Any available human data should also be presented. Where a product is based on an approved active constituent, it may be possible to estimate the toxicity of a formulation by extrapolation from data on the active constituent. Data on the product to be registered is always preferable, and should address the acute toxicity considerations.			
Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.	No specific policy applies to mixtures. As stated above data is used from mixtures tested as a whole or not tested as a whole. For those not tested as a whole each ingredient in the mixture is considered separately against the health effects criteria. Information on health effects for a substance can be obtained from existing classifications for substances which have similar structural relationships. For new industrial chemicals analogue data for specific chemicals is only accepted when specific data is unobtainable and the structural relationship is close.	Extrapolation from the hazards of individual components is used when information on the acute or chronic hazards of the mixture is not available. There is generally no information on the effects of chronic exposure to mixtures of chemicals, or where more than one active constituent is used in combination.			

Please describe any standardised approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.	Concentration cut-off levels are used to determine whether or not a mixture is hazardous on the basis of its ingredients, and to classify the mixture on the basis of its health effects. Formula as applied to the calculation of cut-offs for mixtures are taken from EC methodology. Currently being updated to reflect the amendments of EC directive 93/18/EC.	Not done			
Please briefly describe the rationale for the standardized approach to untested mixtures.	No specific mixtures rationale is applied but if the mixture has not been tested as a whole the health effects data of each ingredient in the mixture are considered. Mixtures do not require additional animal testing will need to be carried out if individual chemical data is available.				
How are mixtures classified when some endpoints have test data and others don't?	No specific mixtures policy but, as mentioned above, information on health effects for a substance can be obtained from existing classifications for substances which have similar structural relationships.	Consideration of all data available is made, and a conservative approach, involving the use of the most toxic endpoint is used. In some cases, additional safety factors may be used to limit exposure where the information available is limited.			
Is there any other information regarding the approach to mixture classification that needs to be addressed?	No.	The difficulty in determining the risks posed by exposure to more than one chemical; particularly over a long period is of concern for public health risk assessment. It has been noted that the matrices for determining risks from multiple exposure are extremely complex, and the matter is currently under consideration. In Australia, we have been noting with interest the research on this matter			

		being carried out, and await the outcome of this work.			
Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?	No				

Additional Questions Regarding Mixture Classifications:

1. How are hazardous liquid or solid hazardous wastes (mixtures) classified as hazardous to health and the environment for purposes of classification and labelling? In what circumstances?

2. How are articles classified under your system? How is article defined? Are articles exempted? Under what circumstances?

Workplace:

Article: An item which is formed to a specific shape, surface or design during production, has an end function dependent in whole or in part on its shape or design, and which undergoes no change in chemical composition and physical state during the end use except as an intrinsic aspect of that end use. Fluids and particles are not considered articles, regardless of the shape or design.

Department of Health:

In the system of classifying poisons, a chemical is defined as being a poison if it is a substance listed in the schedules, or if it contains a substance listed in the schedules. Rather than making a general exemption for articles, the decision was made to specifically list items which are exempted, even though they may contain scheduled materials. These are listed as a separate Appendix in the SUSDP. Examples of exempted products which may contain poisons include ceramics, batteries, electronic components, explosives, food, matches, glass, timber, paper, porcelain etc. Some items (such as food) are controlled under specific legislation; other are controlled only by the provisions of the Trade Practices Act. New articles can be added to the exempt list as required.

3. How are alloys treated under your system? Are they considered mixtures? Is there any special consideration?

Workplace: Alloys are not distinguished.

4. Are there any other products that receive special treatment, e.g., elastomers? What are they, and how are they classified?

5. Are there any products that are addressed under special sectors, but are also covered in the workplace (e.g., pharmaceuticals)? What accommodations are made in the general use/workplace approach to address these types of products?

6. Please indicate any key definitions from your system that will help those unfamiliar with it to understand the scope and substance of the approach.

7. Is your system patterned after another existing system? Which one? Are you aware of your system being applied somewhere outside your own country or region?

Workplace: the National Commission has adopted the classification criteria of the European Communities.

Department of Health:

The Australian system has historically developed within Australia, rather than being patterned on any external system. Recently, there have been moves for Australia and New Zealand to harmonize the controls on poisons. The two systems were already similar, and moves are underway to attempt to harmonize fully.

8. Are there any lessons you have learned in implementing your system that would help us in considering a proposed approach? Anything you would do differently now having that knowledge?

9. Are there any other aspects of your system that you would like to describe to ensure we have a complete picture of your approach.

AUSTRIA					
System Element	**Workplace**	**Pesticides**	**Consumer Products**	**Cosmetics**	**Other**
Regulation/law.	Chemicals Act 1996 (FLG 53/1997) 67/548/EEC 88/379/EEC	Plant Protection Products Act 1997 (FLG 60/1997)	Same as referring entries for general use/workplace.		
Which health or environmental endpoints are covered by the system?	see Section 3 – Paragraph 1 Chemicals Act 1996 or Section 2 – Paragraph 2 67/548/EEC	see Section 3 Paragraph 1 Chemicals Act 1996			
Definition of substance/chemical.	see Section 2 - Paragraph 1 Chemicals Act	see §2 Plant Protection Products Act 1997			
Definition of mixture/preparation.	see Section 2 - Paragraph 5 Chemicals Act	see §2 (5) Plant Protection Products Act 1997			
Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.	legislation	legislation			
Who is responsible for the classification of the mixture?	see Section 27 Chemicals Act	see §§ 37(3) and 40 Plant Protection Products Act 1997			
Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?	Yes, existing data complying with GLP; there also exist calculation methods	test data on Pesticides are used as basis for classification.			
Is testing obligatory? Are there any exceptions to the obligatory testing requirements?	only for new substances, Section 7 Chemicals Act	testing obligatory			
Where complete testing data are not available on the mixture	see Chemicals Ordinance FLG No	for Pesticides authorised according to			

itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.	208/1989, Section 3 Paragraph 2 such methods are not allowed	the Plant Protection Act 1948 without re-evaluation according to the Plant Protection Acts 1990 or 1997 extrapolation of hazards according to Chemicals Act 1997 ordinance FLG 620/1993			
Please describe any standardized approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.	calculation methods based on concentration limits of ingredients as outlined in Directive 88/379/EEC				

BRAZIL					
System Element	**Workplace**	**Pesticides**	**Consumer Products**	**Cosmetics**	**Other**
Regulation/law.	Brazil approved the ILO convention 170, 1990, concerning safety in the use of chemicals at work, by legislatiive law. This convention and the recommendatiom177 establishes general guidelines to chemical classification but this have not regulated in ordinary law.	To agriculture use	include home use insecticides, rat poison, insect repellent regulation 321 07/28/1997	include personal hygiene, cosmetocs, perfumes	transport of dangerous goods mercosul accord law 1797 01/25/1996
Which health or environmental endpoints are covered by the system?		Toxicity in superior animals; mutagenicity, embryotoxicity and carcinogenicity in	Toxicity in superior animals, reproductive effects, teratogenicity, acute and chronic	the law regulates that the chemicals which can participate in cosmetics and other	The basis for the classification are similar to those in recommendation for

		animals; toxicity to microorganisms, microcrustaceans, fish, algae, soil and plant organisms, bioaccumulation, persistence, biodegradation.	neurotoxicity, genetic effects, NOEL, NOAEL, IDA, TLV, RD, ETC. Carcinogenic reppelent isn't authorized. Deactivation and discard methods are necessary, stability	mixtures composition need to be harmless and they are present in a list of ministry of health. There isn't reference to environment.	transport of dangerous goods by un
Definition of substance/chemical.		Don't have	don't have	don't have	
Definition of mixture/preparation.		Don't have	formulation is an association of active ingredients, solvents, diluents, additives, inert substances and other components to obtain an efficient and useful end product to its purpose	don't have	
Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.			yes		
Who is responsible for the classification of the mixture?		Ministry of health; ministry of environment and ministry of agriculture	ministry of health	ministry of health	the basis for the classification are elaborated by the ministry of transport of the countries, but the classification is done by the dangerous chemicals transporter.
Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?		yes	yes	no	yes
Is testing obligatory? Are there any exceptions to the obligatory testing requirements?			No, the mixture is not authorized in this case	normally, there isn't obligation of tests when the formulation is made	

				with authorized chemicals. On the other hand, the ministry of health need emit an opinion about the mixture harmless	
Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.		no		Only are accepted mixtures with authorized ingredients.	
Please describe any standardized approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.		There are lists with authorized substances with its % cut-offs. But even in this case , tests in the mixture are required.	There are lists with authorized substances with its % cut-offs. But even in this case , tests in the mixture are required	The classification is done in comparison with the list of authorized substances	
Please briefly describe the rationale for the standardized approach to untested mixtures.					
How are mixtures classified when some endpoints have test data and others don't?					
Is there any other information regarding the approach to mixture classification that needs to be addressed?					

Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?					

JAPAN						
System Element	**General Use 1**	**General Use 2**	**Workplace**	**Pesticides**	**Consumer Products**	**Cosmetics**
Regulation/law	Poisonous and Deleterious Substances Control Law	The Law concerning the Examination & Regulation of Manufacture, etc. of Chemical Substances	Industrial Safety & Health Law	Agricultural Chemicals Law	Food Sanitation Law	Pharmaceutical Affairs Law
Which health or environmental endpoints are covered by the system?	Acute toxicity & irritancy (not specified in the law)	biodegradability, bioaccumulation, chronic toxicity, reproductive toxicity, teratogenicity, mutagenicity, carcinogenicity, toxicokinetics, pharmacological tests	mutagenicity, carcinogenicity	human health and environmental safety (not specified)	health end point (not specified)	health end point (not specified)
Definition of substance/chemical.	All substances except pharmaceuticals	compound obtained by causing a chemical reaction to occur in elements, a compound and/or compounds, excluding in the following: specified poisons, stimulants ,stimulants' ??? materials, narcotics, & psychotropics, radioactive substances.	chemical substance means element and compound (article 2)	agricultural chemicals: substances for control of fungi, ?, mites, insects or other animals and plants or viruses which are injurious to crops including natural enemies and for plant growth regulators	substances to be used in or on food, in the process of manufacturing food or for the purpose of processing or preserving food, by adding, mixing, ? or other means	article intended to be used by means of rubbing, sprinkling or by similar application to the human body or cleaning, beautifying, promoting effectiveness, altering the appearance of the human body, and for keeping the skin and hair healthy.

Definition of mixture/preparation.	No definition in the law. Toxic mixtures and preparations are listed in the same way as toxic pure substances.	No definition (a mixture whose components cannot be separated is handled in the same way as pure substances)	No definition	formulation: the combination of various ingredients	no definition	no definition
Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.	Definition by the law and the Cabinet Order	Chemical: By the law Mixture: The interpretation in above is mentioned by notice	N/A	by the law	N/A	N/A
Who is responsible for the classification of the mixture?	The Government of Japan	The Government of Japan	N/A	The Government of Japan	N/A	N/A
Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?	Yes. If human experience is available, test data will not be ?	yes	N/A	yes	N/A	N/A
Is testing obligatory? Are there any exceptions to the obligatory testing requirements?	no	obligatory testing: new chemicals exceptions: new chemicals to be produced or imported in less 1 l/year	N/A	yes, no exceptions	N/A	N/A
Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.	Based on expert judgment	if there is scientific knowledge, it can be used	N/A	N/A	N/A	N/A

Please describe any standardized approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.	No standardized methodology is established	No standardized methodology is established	No standardized methodology is established	No standardized methodology is established	No standardized methodology is established	No standardized methodology is established
Please briefly describe the rationale for the standardized approach to untested mixtures.	N/A	N/A	N/A	N/A	N/A	N/A
How are mixtures classified when some endpoints have test data and others don't?	only available data are examined	mixtures are classified by available data	N/A	N/A	all data are required	all data are required
Is there any other information regarding the approach to mixture classification that needs to be addressed?	No	no	no	no	no	no
Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?	nothing special for the moment	nothing special for the moment	no	no	no	no

KOREA						
System Element	**General Use**	**Workplace**	**Pesticides**	**Consumer Products**	**Cosmetics**	**Other**
Regulation/law.	Toxic Chemicals Control Act (TCCA)	industrial safety and health act/ presidential decree/ ministerial ordinance/ public notice of the ministry of labor(mol)	agrochemicals management act (ama)			
Which health or environmental endpoints are covered by the system?	A. Health endpoints: acute toxicity,(oral, dermal, inhalation) irritation(skin, eye, respiratory) corrosion(skin, eye) sensitization(skin, respiratory) mutagenicity carcinogenicity reproductive toxin long-term systemic toxicity B. Environmental endpoints: aquatic toxicity(fish, daphnia, algae) degradation octanol-water partition coefficient bioaccumulation.	Classification standards are regulated in the standards for preparing and keeping on file the msds, etc.(mol public notice no. 97-27) substances hazardous to health: highly toxic, toxic, corrosive, irritating, sensitizing, carcinogenic, mutagenic, toxic for reproduction. Hazardous substances environment: physically hazardous substances: explosive, oxidizing, extremely, water prohibiting (refer to annex for details)	both			
Definition of substance/chemical.	chemical substances: materials created by an artificial chemical reaction of elements or any combination thereof or a material extracted and purified from substances occurring in nature	"chemical substances" refers to any element or substance created as a result of a chemical reaction in such elements.	pesticides			

Definition of mixture/preparation.	Mixture: a product which is processed by advertently adding chemical to other chemical substances for the purpose of efficient use thereof.	"mixture" refers to any substance in which two or more chemical substances commingled without a chemical reaction "preparation" refers to any product manufactured by adding vehicle, solvent, stabilizer, etc. to the main component of chemical substances	Combined pesticides			
Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.	A. both definitions are provided in the relevant regulations. . regulatory citations: (a) chemical substances: TCCA, Article 3 (b) mixture: national institute of environmental research's (NIER) Public Notice No. 1997-3	definitions for each term are included in the standards for preparing and keeping on file the msds, etc. (mol public notice no. 97-3 give regulatory citation where available: workplace in the nation.	Definitions are in the ama			
Who is responsible for the classification of the mixture?	Suppliers, handlers, and transporters of toxic chemicals the recommended classifications for toxic chemicals are provided by NIER	A business owner who is classified to manufacture, import, use, transport or store the mixture	Rural development administration (rda)			
Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?	Partly, yes classification of mixtures, which is provided by NIER public notice no. 1997-2 and no. 1997-3, is only based on the most hazardous components, but a person who is responsible for classification can reclassify the mixture if someone knows the hazard of mixture	no	Yes, test should be done for all the combined pesticides before registration			

	itself or has test data.					
Is testing obligatory? Are there any exceptions to the obligatory testing requirements?	Testing is not obligatorily required	testing of a mixture is not an obligation	Testing is obligatory. There is no exception.			
Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.	There are not any provisions in the regulations. However, it would be possible if the use of either data is applied on the side of precaution.	No other data is used	There are complete testing data for all the mixtures.			
Please describe any standardized approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.	There are not overall standardized concentration cut-off values to classify mixtures. However, the lowest percentage cut-off values are used as follows: (there are some exceptions) for carcinogenicity and reproductive toxicity: 0.1% for other endpoints:1.0%	methods for classifying mixtures when test data is not available, are as follows: in the case of physically dangerous substances, the data on the individual chemicals that compose the mixture is used for the assessment in the case of health hazardous substances, the substance in question is considered to be similarly health hazardous as the individual chemicals, if the individual chemicals that compose the mixture	No standardized approach to classifying mixtures.			

		constitute more than 1% of the chemical(over 0.1%, by weight ratio, for carcinogenic chemicals)				
Please briefly describe the rationale for the standardized approach to untested mixtures.	NIER public notice provides the appropriate classifications of any mixtures based on the most hazardous component which is toxic chemical. TCCA's mixture classification scheme covers only the toxic chemical. Thus, any mixture not designated as toxic chemicals is not necessarily classified by the NIER's recommendation.	The classification point of the mixture in question is determined from the data on the individual components that constitute the mixture	none			
How are mixtures classified when some endpoints have test data and others don't?	Our mixture classifications are only based on available test dataat the time of classification. Available test data would be very valuable because some substances are extensively tested and others not.	In case where test results of hazardness mixtures exist, sucg data is preferentially used to decide whether or not the mixture is hazardous. In case where test results of hazardness of mixtures do not exist, the decision is made based on the hazardness of the component substances of the mixture.	none			
Is there any other information regarding the approach to mixture classification that needs to be	It is very important to understand the definition, designation criteria and scope of toxic chemicals	no	no			

addressed?						
Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?	not yet however, if classification scheme of the mixture will be globally harmonized, it will be introduced in a positive manner.	no	no			

NEW ZEALAND					
System Element	**Workplace**	**Pesticides**	**Consumer Products**	**Cosmetics**	**Other**
Regulation/law	Hazardous Substances & New Organisms (HSNO) Act (Regulations under development) This statute encompasses all substances (including mixtures) above a certain degree of hazard regardless of end use – e.g. pesticides, explosives etc all included.	Hazardous Substances & New Organisms Act (Regulations under development) **and** Agricultural compounds and Veterinary Medicines (ACVM) Act	Hazardous Substances & New Organisms Act (Regulations under development)	Limited control under the Medicines Act	Fair Trading Act requires all goods to be fit for purpose
Which health or environmental endpoints are covered by the system?	any of the following hazardous properties, provided a threshold is exceeded explosive capacity flammability oxidising capacity corrosiveness toxicity ecotoxicity	As at left plus (ACVM Act) animal welfare export produce certification compliance with food standards	As for general use/ workplace	Extensive power to take action if a person injured by product	Extensive power to take action of product fails in intended purpose
Definition of substance/chemical	(s.2 HSNO Act) (a) Any element, defined mixture of elements, compounds, or defined mixture of compounds, either naturally occurring or produced synthetically, or any mixtures thereof:	As at left	As at left	any natural or artificial substance, whether in solid or liquid form or in the form of a gas or vapour:	

	(b) Any isotope, allotrope, isomer, congener, radical, or ion of an element or compound which has been declared by the Authority, by notice in the Gazette, to be a different substance from that element or compound: (c) Any mixtures or combinations of any of the above: (d) Any manufactured article containing, incorporating, or including any hazardous substance with explosive properties:				
Definition of mixture/preparation	Identical to that for substance	As at left	As at left	As above	
Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.	Definition is in the statute. Definition is limited by a regulation making power to set thresholds for hazardous substances below which the statute does not apply	As at left	As at left	Substances generally considered product by product	
Who is responsible for the classification of the mixture?	Classification scheme is in regulations – administering authority may alter the controls attached to the classification.	Classification will be primarily as at left. However the ACVM Act provides for "purpose specific" controls for the reasons given above on a case by case basis (in practice much will be done with certain classes)	As for first column	Classification generally not undertaken	
Are available test data on the mixture	Generally, yes. In the absence of test data,	Test data for the (pesticide) mixture may	As for first column		

used as the basis for classification of the mixture? Any exceptions?	judgements based on estimation or extrapolation are used. This area will be better defined over the next 3-4 months as part of methodology development under the HSNO Act.	be required for pesticides. NB test results from other countries are accepted any only NZ specific matters require further testing.			
Is testing obligatory? Are there any exceptions to the obligatory testing requirements?	Generally no. However, in some cases (e.g. pesticide formulations) test data may be required.	See above	As for first column		
Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.	Generally, yes. (see response above)	Yes – subject to above qualifications	As for first column		
Please describe any standardized approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.	NZ presently does not have "standardised approaches" in regulation or statute. However judgements have historically been based on practices recommended by international organisations (e.g. WHO recommendations for human toxics, UNCETDG approach for explosive, flammable etc).	As at left noting above qualifications	As for first column		
Please briefly	See above – approach		As for first column		

describe the rationale for the standardized approach to untested mixtures.	used is because historically NZ has been a largely an importer rather than manufacturer of these substances.				
How are mixtures classified when some endpoints have test data and others don't?	This has been based on expert judgement (& is likely to continue) with a weighting in favour of test information about the actual mixture.	See above	As for first column		
Is there any other information regarding the approach to mixture classification that needs to be addressed?					
Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?	New Zealand will complete regulations and a methodology under s.9 of the HSNO Act by September of this year – both will have effects on the attitudes taken	ACVM Act will be in force at the same time as HSNO Act.	As for first column		

NORWAY					
System Element	**General Use/Workplace**	**Pesticides**	**Consumer Products**	**Cosmetics**	**Other**
Regulation/law.	Regulations relating to the classification, labelling, etc. of dangerous chemicals With supplementary regulations: Regulations relating to criteria for the classification of dangerous chemicals Regulations relating to symbols, symbol letters, indications of danger and warning phrases to be used in labelling dangerous chemicals Regulations relating to the choice of safety advice phrases and requirements for the labelling of dangerous chemicals Regulations relating to packaging fitted with child-resistant fastenings and tactile warning of danger		General use		

	Regulations relating to the labelling of chemicals, substances and preparations, containing organic solvents (OAR-labelling)				
Which health or environmental endpoints are covered by the system?	= Directive 67/548/EEC + 88/379/EEC and in addition organic solvents which may be used in such a way that they are dangerous to health		= General use		
Definition of substance/chemical	= Directive 67/548/EEC + 88/379/EEC and *chemicals* is the generic term both for substances and preparations		= General use		
Definition of mixture/preparation	= Directive 67/548/EEC + 88/379/EEC and *chemicals* is the generic term both for substances and preparations		= General use		
Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.	In the regulation		= General use		
Who is responsible for the classification of the mixture?	Any person that manufactures, imports and/or places on the market dangerous chemicals		= General use		
Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?	= Directive 67/548/EEC + 88/379/EEC except for sensitising properties Norwegian regulation do not accept testing (classification on the basis of their constituents)		= General use		
Is testing obligatory? Are there any exceptions to the obligatory testing requirements?	No – testing is not accepted for sensitising, cancerogenic, mutagenic or reproductive property		= General use		
Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the	= Directive 67/548/EEC + 88/379/EEC		= General use		

hazards? Give examples.					
Please describe any standardized approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.	= Directive 67/548/EEC + 88/379/EEC except for cancerogenic chemicals. Norwegian legislation includes a two step system: firstly the substance is evaluated to determine whether or not it is cancerogenic on the basis of any results available from studies and secondly the dose-response relationship is assessed to decide the potency of the substances as a carcinogen. On the basis of these results, carcinogenic substances are classified in three groups (high (K1), medium (K2) and low (K3) potency). Preparations are classified solely on the basis of the concentrations of their constituents and the classification of these. A preparation shall be classified as cancerogenic if it contains more than 0.01 % of a high potent substance (K1), 0.1 % of a medium potent substance (K2) or 1 % of a low potent substance (K3).		= General use		
Please briefly describe the rationale for the standardized approach to untested mixtures.	= Directive 67/548/EEC + 88/379/EEC The exception for sensitising properties (from the EU system) is based on the lack of validated test methods for testing of preparations. The test methods are designed for substances and not for preparations. In these, the substance is diluted and the concentration is too low to give optimal test conditions. False negatives might be expected.		= General use		
How are mixtures classified when some endpoints have test data and others don't?	= Directive 67/548/EEC + 88/379/EEC		= General use		

Is there any other information regarding the approach to mixture classification that needs to be addressed?	= Directive 67/548/EEC + 88/379/EEC		= General use		
Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?	Any changes in the EU system (i.e. Directive 67/548/EEC + 88/379/EEC)		= General use		

SLOVENIA					
System Element	**Workplace**	**Pesticides**	**Consumer Products**	**Cosmetics**	**Other**
Regulation/law.	Articles 19-23 of the proposal of the Act on Chemicals which is in the Parliamental procedure just now, as well as two new regulations on CPL of substances and of preparations	the same as for general use	the same as for general use	final cosmetic products are exempted from the Regulation on CPL of preparations; however the products like dispensers with flammable aerosols are to be labelled according to their flammability with additional warning text	The provisions of the new Slovene Regulation on CPL of preparations do not apply to the following substances and preparations which are, in their final state, intended for the final user and governed by other regulations: medicinal products in human and veterinary use, drugs, cosmetic products, mixtures of waste substances, unless otherwise prescribed in the regulations related to waste, foodstuffs, animal feedingstuffs, radioactive preparations, ammunitions and explosives placed on the market for pyrotechnical purposes or for blasting. In addition, the provisions of the new Slovene Regulation on CPL of preparations also do not apply to: - the transportation of dangerous goods by road, rail, on inland waterways, sea or air,

					preparations in transit which are under customs control and are not processed, re-packaged or treated on the territory of the Republic of Slovenia.
Which health or environmental endpoints are covered by the system?	beside physico-chemical properties as extremely, very toxic, toxic, harmful, corrosive, irritant, sensitizing, carcinogenic, mutagenic, preparations toxic for reproduction, preparations dangerous for the environment (aquatic environment - fish, Daphnia, algae, non-aquatic environment - flora, fauna, soil organisms, bees, ozone layer, degradability - COD, BOD)	the same as for general use	the same as for general use		
Definition of substance/chemical.	a) substances are chemical elements or their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the products and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition. b) chemicals are substances and preparations	the same as for general use	the same as for general use		
Definition of	Preparations are	the same as for general	the same as for		

mixture/preparation.	mixtures or solutions composed of two or more substances	use	general use		
Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.	definitions are from the proposal of the Act on chemicals which is in the Parliamental procedure just now, and also from two new Regulations on CPL of substances and preparations	the same as for general use	the same as for general use		
Who is responsible for the classification of the mixture?	the person putting it on the market, for control of proper CPL Ministry of Health with Health Inspectorate is responsible (according to the new Act on chemicals specialized inspectors for chemicals will be trained).	the same as for general use	the same as for general use		
Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?	Yes. Available test data or data deriving from practical experience in humans are superior to the calculation method (for detailed wording see Annex - Article 5 of our new Regulation on CPL of preparations)	the same as for general use	the same as for general use		

Is testing obligatory? Are there any exceptions to the obligatory testing requirements?	If any of the toxicological properties of the preparation was not ascertained during the experimental procedure referred to in paragraph 2 (b) of the Article 5, it must be assessed in accordance with the agreed calculation method from paragraph 2 (a) of the Article 5. Responsible persons carrying out manufacturing, importing and distributing of dangerous preparations are obliged to perform all necessary investigations in order to obtain existing data on the properties of the preparation and its effects on human health and the environment. In the case of preparations for which there is no data available, or where the data was not obtained in accordance with the methods referred to in Annex V to the Regulation on Dangerous Substances, the requirements for further testing shall be considered on a case-by-	the same as for general use	the same as for general use		

	case basis in order to reduce the tests on animals. In order to avoid the need to perform tests on vertebrates, responsible persons manufacturing, importing or distributing the same preparation should agree in writing on mutual use of obtained toxicological and ecotoxicological data if it is possible to prove that the preparations are identical to such a degree that their toxicological and ecotoxicological properties are the same. (for detailed wording see Annex - Article 5 of our new regulation on CPL of preparations)				
Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.	Yes. For instance it could be possible for isomeres if we suppose that they dont have very different toxicological properties. We still lack practical experience	the same as for general use	the same as for general use		
Please describe any standardized approach to classifying mixtures when test data are not available (e.g., formulae or	It is the agreed calcualtion method of EU which we adopted. We dont describe the detailes here because the	the same as for general use	the same as for general use		

percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.	system is completely the same as of EU.				
Please briefly describe the rationale for the standardized approach to untested mixtures.	They shall be classified according to all the test data collected and for other properties calculation method is to be used. When the preparation contains at least one component labelled (in accordance with the Regulation on Dangerous Substances) with the special notice "Warning Substance not thoroughly tested", the preparation should be clearly labelled with the notice: "Warning preparation contains substance which has not been thoroughly tested"	the same as for general use	the same as for general use		
How are mixtures classified when some endpoints have test data and others don't?	on a case-by-case basis (for detailed wording see Annex - Article 5 of our new regulation on CPL of preparations)	the same as for general use	the same as for general use		
Is there any other information regarding the approach to mixture classification that needs	all the details of the EU system are to be addressed	the same as for general use	the same as for general use		

to be addressed?					
Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?	approximation to EU	the same as for general use	the same as for general use		

SWEDEN					
System Element	**Workplace**	**Pesticides**	**Consumer Products**	**Cosmetics**	**Other**
Regulation/law.	See EU legislation. Beside that, Sweden has national derogations as defined in the Accession Treaty, article 112.	Sweden has a national derogation for classification of pesticides as defined in the Accession Treaty, article 112.	See EU legislation. Beside that, Sweden has national derogations as defined in the Accession Treaty, article 112.		
Which health or environmental endpoints are covered by the system?	See EU legislation. Swedish national derogations concern the following endpoints: -defatting of skin -acute/repeated inhalatory toxicity (See separate explanation of the rules.)	For classification of pesticides Sweden apply the same rules as for dangerous preparations for general use and work place use; see EU legislation and the connected Swedish derogations.	See EU legislation. Swedish national derogations concern the following endpoints: -acute oral toxicity -defatting of skin -acute/repeated inhalatory toxicity (See separate explanation of the rules.)		
Definition of substance/chemical.					
Definition of mixture/preparation.					
Are these definitions in the regulation or legislation, or have they been developed as interpretational or working definitions? Give regulatory cites where available.					
Who is responsible for the classification of the					

mixture?					
Are available test data on the mixture used as the basis for classification of the mixture? Any exceptions?					
Is testing obligatory? Are there any exceptions to the obligatory testing requirements?					
Where complete testing data are not available on the mixture itself, is the use of other data (such as structure/activity relationships) allowed to estimate or extrapolate the hazards? Give examples.					
Please describe any standardized approach to classifying mixtures when test data are not available (e.g., formulae or percentage cut-offs). Where a different approach is used for any of the health or environmental endpoints, please identify the endpoints and the approach used.					
Please briefly describe the rationale for the standardized approach to untested mixtures.					
How are mixtures classified when some endpoints have test data					

and others don't?					
Is there any other information regarding the approach to mixture classification that needs to be addressed?					
Is there any future or pending work or activity that is likely to have an impact on the harmonization of mixture criteria?					

APPENDIX V: EU ENVIRONMENTAL CRITERIA

Article 7

Evaluation of environmental hazards

1. The hazards of a preparation for the environment shall be assessed by one or more of the following procedures :

   (a) by a conventional method described in [...] Annex III to this Directive [...].

   (b) by determining the hazardous properties of preparation for the environment necessary for appropriate classification in accordance with the criteria in Annex VI of Directive 67/548/EEC. These properties will be determined by means of the methods laid down in Part C of Annex V to Directive 67/548/EEC unless, in the case of plant protection products, other internationally recognised methods are acceptable in accordance with the provisions of Annexes II and III of Directive 91/414/EEC. Without prejudice to the testing requirements set out in Directive 91/414/EEC the conditions for application of the test methods shall be described in Annex III Part C to this Directive.

3. When an ecotoxicological property is established by method 1(b) [...] to obtain new data, the test shall be conducted in compliance with the principles of good laboratory practice provided for in Directive 87/18/EEC and with the provisions of Directive 86/609/EEC.

Where the environmental hazards have been assessed by both the procedures mentioned above, the results of the methods referred to in 1(b) [...] shall be used for classifying the preparation.

4. For preparations of a known composition with the exception of those covered by Directive 91/414/EEC classified in accordance with method 1(b) above a new evaluation of environmental hazard either by method 1(a) or 1(b) shall be performed whenever:

   – changes of composition of the initial concentration as a weight/weight or volume/volume percentage, of one or more of the dangerous constituents are introduced by the manufacturer, in accordance with the following table :

Initial concentration range of the constituent	Permitted variation in initial concentration of the constituent
≤ 2.5%	± 30%
> 2.5 ≤ 10%	±20%
> 10 ≤ 25%	±10%
> 25 ≤ 100%	±5%

– changes of composition involving the substitution or addition of one or more constituents, which may or may not be dangerous within the meaning of the definitions of this Directive, are introduced by the manufacturer.

This will apply unless there is valid scientific justification for considering that a re-evaluation of the hazard will not result in a change of classification.

ANNEX III

PART A

METHODS FOR THE EVALUATION OF THE ENVIRONMENTAL HAZARDS OF PREPARTIONS IN ACCORDANCE WITH ARTICLE 7

Introduction

The systematic assessment of all the dangerous properties for the environment is expressed by means of concentration limits, expressed as a weight/weight percentage except for gaseous preparations where they are expressed as a volume/volume percentage and in conjunction with the classification of a substance.

Part A gives the calculation procedure according to Article 7(1)(a) and 7(2)(a) and gives the R phrases to be assigned to the classification of the preparation.

Part B gives the concentration limits to be used when applying the conventional method and the relevant symbols and R phrases for classification.

In accordance with Article 71(a) the environmental hazards of a preparation shall be assessed by the conventional method described in parts A and B of this Annex, using individual concentration limits.

(a) Where the dangerous substances listed in Annex 1 to Directive 67/548/EEC are assigned concentration limits necessary for the application of the method of assessment described in part A or this Annex (...), these concentration limits must be used.

(b) Where the dangerous substances do not appear in Annex 1 to Directive 67/548/EEC or appear there without the concentration limits necessary for the application of the method of evaluation described in Part A of this Annex (...), the concentration limits shall be assigned in accordance with the specification in part B of this Annex (...).

Part C gives the test methods for the evaluation of the hazards for the aquatic environment.

Procedure for evaluation of environmental hazards

a) Aquatic environment

I. Conventional method for the evaluation of hazards to the aquatic environment

The conventional method for the evaluation of hazards to the aquatic environment takes into account all the hazards that a substance may entail for this medium according to the following specifications.

The following preparations shall be classified as dangerous for the environment

I.1. and assigned the symbol ‘N’, the indication of danger ‘dangerous for the environment’ and the risk phrases R50 and R53 (R50-53):

I.1.1. preparations containing one or more substances classified as dangerous to the environment and to which is assigned phrases R50-53 in individual concentrations equal to or greater than:

a) either the concentration specified in Annex I to Directive 67/548/EEC for the substance or substances under consideration, or

b) the concentration specified in Part B of this Annex (Table 1) where the substance or substances do not appear in Annex I to Directive 67/548/EEC or appear in it without concentration limits;

I.1.2. preparations containing more than one substance classified as dangerous for the environment and to which is assigned phrases R50-53 in lower individual concentrations than the limits specified under I.1.1a) or b) if:

$$\sum\left(\frac{P_{N,R50-53}}{L_{N,R50-53}}\right)\geq 1$$

where: PN,R50-53 is the percentage by weight of each substance dangerous for the environment to which is assigned phrases R50-53 in the preparation,

LN,R50-53 is the limit R50-53 for each substance dangerous for the environment to which is assigned the phrases R50-53, expressed as percentage by weight

I.2. and assigned the symbol 'N', the indication of danger 'dangerous for the environment' and the risk phrases R51 and R53 (R51-53) unless the preparation is already classified according to I.1. above.

I.2.1. preparations containing one or more than one substance classified as dangerous to the environment and to which is assigned phrases R50-53 or R51-53 in individual concentrations equal to or greater than:

a) either the concentration specified in Annex I to Directive 67/548/EEC for the substance or substances under consideration, or

b) the concentration specified in Part B of this Annex (Table 1) where the substance or substances do not appear in Annex I to Directive 67/548/EEC or appear in it without concentration limits;

I.2.2. preparations containing more than one of the substances classified as dangerous for the environment and to which is assigned phrases R50-53 or R51-53 in lower individual concentrations than the limits specified under I.2.1a) or b) if:

$$\sum\left(\frac{P_{N,R50-53}}{L_{N,R51-53}}+\frac{P_{N,R51-53}}{L_{N,R51-53}}\right)\geq 1$$

where: PN,R50-53is the percentage by weight of each substance dangerous for the environment to which is assigned phrases R50-53 in the preparation,

PN,R51-53is the percentage by weight of each substance dangerous for the environment to which is assigned phrases R51-53 in the preparation,

LN,R51-53 is the respective limit R51-53 for each substance dangerous for the environment to which is assigned phrases R50-53 or R51-53, expressed as percentage by weight

I.3. and assigned the risk phrases R52 and R53 (R52-53) unless the preparation is already classified according to I.1. or I.2. above.

I.3.1. preparations containing one or more than one substance classified as dangerous to the environment and to which is assigned phrases R50-53 or R51-53 or R52-53 in individual concentrations equal to or greater than:

a) either the concentration specified in Annex I to Directive 67/548/EEC for the substance or substances under consideration, or

b) the concentration specified in Part B of this Annex (Table 1) where the substance or substances do not appear in Annex I to Directive 67/548/EEC or appear in it without concentration limits;

I.3.2. preparations containing more than one of the substances classified as dangerous for the environment and to which is assigned phrases R51-53 or R50-53 or R52-53 in lower individual concentrations than the limits specified under I.3.1a) or b) if:

$$\sum\left(\frac{P_{N,R50-53}}{L_{R52-53}}+\frac{P_{N,R51-53}}{L_{R52-53}}+\frac{P_{R52-53}}{L_{R52-53}}\right)\geq 1$$

where: PN,R50-53 is the percentage by weight of each substance dangerous for the environment to which is assigned phrases R50-53 in the preparation,

PN,R51-53 is the percentage by weight of each substance dangerous for the environment to which is assigned phrases R51-53 in the preparation,

PR52-53 is the percentage by weight of each substance dangerous for the environment to which is assigned phrases R52-53 in the preparation,

LR52-53 is the respective limit R52-53 for each substance dangerous for the environment to which is assigned phrases R50-53 or R51-53 or R52-53, expressed as percentage by weight

I.4. and assigned the symbol 'N', the indication of danger 'dangerous for the environment' and the risk phrase R50unless the preparation is already classified according to I.1. above:

I.4.1. preparations containing one or more than one substance classified as dangerous to the environment and to which is assigned phrase R50 in individual concentrations equal to or greater than:

a) either the concentration specified in Annex I to Directive 67/548/EEC for the substance or substances under consideration, or

b) the concentration specified in Part B of this Annex (Table 2) where the substance or substances do not appear in Annex I to Directive 67/548/EEC or appear in it without concentration limits;

I.4.2. preparations containing more than one substance classified as dangerous for the environment and to which is assigned phrase R50 in lower individual concentrations than the limits specified under I.4.1a) or b) if:

$$\sum\left(\frac{P_{N,R50}}{L_{N,R50}}\right)\geq 1$$

where: PN,R50 is the percentage by weight of each substance dangerous for the environment to which is assigned phrases R50 in the preparation,

LN,R50 is the limit R50 for each substance dangerous for the environment to which is assigned phrases R50, expressed as percentage by weight

I.4.3. preparations containing one or more than one of the substances classified as dangerous for the environment and to which is assigned phrase R50 not meeting the criteria under 1.4.1 or I.4.2. and containing one or more than one substance classified as dangerous for the environment and to which is assigned phrases R50-53 if:

$$\sum\left(\frac{P_{N,R50}}{L_{N,R50}}+\frac{P_{N,R50-53}}{L_{N,R50}}\right)\geq 1$$

where: PN,R50 is the percentage by weight of each substance dangerous for the environment to which is assigned phrases R50 in the preparation,

PN,R50-53 is the percentage by weight of each substance dangerous for the environment to which is assigned phrases R50-53 in the preparation,

LN,R50 is the respective limit R50 for each substance dangerous for the environment to which is assigned phrases R50 or R50-53, expressed as percentage by weight

I.5. and assigned the risk phrase R52 unless the preparation is already classified according to I.1., I.2., I.3. or I.4. above:

I.5.1. preparations containing one or more than one substance classified as dangerous to the environment and to which is assigned phrase R52 in individual concentrations equal to or greater than:

a) either the concentration specified in Annex I to Directive 67/548/EEC for the substance or substances under consideration, or

b) the concentration specified in Part B of this Annex (Table 3) where the substance or substances do not appear in Annex I to Directive 67/548/EEC or appear in it without concentration limits;

I.5.2. preparations containing more than one substance classified as dangerous for the environment and to which is assigned phrase R52 in lower individual concentrations than the limits specified under I.5.1a) or b) if:

$$\sum \frac{P_{R52}}{L_{R52}} \geq 1$$

where: PR52 is the percentage by weight of each substance dangerous for the environment to which is assigned phrase R52 in the preparation,

LR52 is the limit R52 for each substance dangerous for the environment to which is assigned phrase R52, expressed as percentage by weight

I.6. and assigned the risk phrase R53 unless the preparation is already classified according to I.1., I.2. or 1.3 above:

I.6.1. preparations containing one or more than one substance classified as dangerous to the environment and to which is assigned phrase R53 in individual concentrations equal to or greater than:

a) either the concentration specified in Annex I to Directive 67/548/EEC for the substance or substances under consideration, or
b) the concentration specified in Part B of this Annex (Table 4) where the substance or substances do not appear in Annex I to Directive 67/548/EEC or appear in it without concentration limits;

I.6.2. preparations containing more than one substance classified as dangerous for the environment and to which is assigned phrase R53 in lower individual concentrations than the limits specified under I.6.1a) or b) if:

$$\sum \left(\frac{P_{R53}}{L_{R53}} \right) \geq 1$$

where: PR53 is the percentage by weight of each substance dangerous for the environment to which is assigned phrase R53 in the preparation,

LR53 is the limit R53 for each substance dangerous for the environment to which is assigned phrase R53, expressed as percentage by weight

I.6.3. preparations containing one or more than one of the substances classified as dangerous for the environment and to which is assigned phrase R53 not meeting the criteria under I.6.2. and containing one or more than one substance classified as dangerous for the environment and to which is assigned phrases R50-53 or R51-53 or R52-53 if:

$$\sum\left(\frac{P_{R53}}{L_{R53}}+\frac{P_{N,R50-53}}{L_{R53}}+\frac{P_{N,R51-53}}{L_{R53}}+\frac{P_{R52-53}}{L_{R53}}\right)\geq 1$$

where: PR53 is the percentage by weight of each substance dangerous for the environment to which is assigned phrase R53 in the preparation,

PN,R50-53 is the percentage by weight of each substance dangerous for the environment to which is assigned phrase R50-53 in the preparation,

PN,R51-53 is the percentage by weight of each substance dangerous for the environment to which is assigned phrase R51-53 in the preparation,

PR52-53 is the percentage by weight of each substance dangerous for the environment to which is assigned phrase R52-53 in the preparation,

LR53 is the respective limit R53 for each substance dangerous for the environment to which is assigned phrase R53 or R50-53 or R51-53 or R52-53, expressed as percentage by weight

b) Non-aquatic environment

b1) Ozone layer

I. Conventional method for the evaluation of preparations dangerous for the ozone layer

The following preparations shall be classified as dangerous for the environment

I.1. and assigned the symbol 'N', the indication of danger 'dangerous for the environment' and the risk phrase R59

I.1.1. preparations containing one or more substances classified as dangerous to the environment and to which is assigned the symbol 'N' and the risk phrase R59 in individual concentrations equal to or greater than:

a) either the concentration specified in Annex I to Directive 67/548/EEC for the substance or substances under consideration, or

b) the concentration specified in Part B of this Annex (Table 5) where the substance or substances do not appear in Annex I to Directive 67/548/EEC or appear in it without concentration limits;

I.2. and assigned the risk phrase R59:

I.2.1. preparations containing one or more substances classified as dangerous to the environment and to which is assigned R59 in individual concentrations equal to or greater than:

a) either the concentration specified in Annex I to Directive 67/548/EEC for the substance or substances under consideration, or

b) the concentration specified in Part B of this Annex (Table 5) where the substance or substances do not appear in Annex I to Directive 67/548/EEC or appear in it without concentration limits;

b2) Terrestrial environment

I. Evaluation of preparations dangerous for the terrestrial environment

Classification of preparations using the risk phrases below will follow after the detailed criteria for use of the phrases have been incorporated in Annex VI to Directive 67/548/EEC.

R54 Toxic to flora
R55 Toxic to fauna
R56 Toxic to soil organisms
R57 Toxic to bees
R58 May cause long-term adverse effects in the environment.

ANNEX III

PART B

Concentration limits to be used in evaluation of environmental hazards

I. For the aquatic environment

The concentration limits fixed in the following tables, expressed as a weight/weight percentage, determine the classification of the preparation in relation to the individual concentration of the substance(s) present whose classification is also shown.

Table 1. : Acute aquatic toxicity and long-term adverse effects

Classification of the substance	Classification of the preparation		
	N, R50-53	N, R51-53	R52-53
N, R50-53	$C_n \geq 25\%$	$2.5\% \leq C_n < 25\%$	$0.25\% \leq C_n < 2.5\%$
N, R51-53		$C_n \geq 25\ \%$	$2.5\% \leq C_n \leq 25\%$
R52-53			$C_n \geq 25\%$

Table 2. : Acute aquatic toxicity

Classification of the substance	Classification of the preparation N, R50
N, R50	$C_n \geq 25\%$
N, R50-53	$C_n \geq 25\%$

Table 3. : Aquatic toxicity

Classification of the substance	Classification of the preparation R52
R52	$C_n \geq 25\%$

Table 4. : Long-term adverse effects

Classification of the substance	Classification of the preparation R53
R53	$C_n \geq 25\%$
N, R50-53	$C_n \geq 25\%$
N, R51-53	$C_n \geq 25\%$
R52-53	$C_n \geq 25\%$

II. For the non-aquatic environment

The concentration limits fixed in the following tables, expressed as weight/weight percentage or, for gaseous preparations as a volume/volume percentage, determine the classification of the preparation in relation to the individual concentration of the substance(s) present whose classification is also shown.

Table 5. : Dangerous for the ozone layer

Classification of the substance	Classification of preparation N, R59
N with R59	C ≥0.1 %

Classification of the substance	Classification of preparation R59
N with R59	C ≥ 0.1 %
R59	C ≥ 0.1 %

ANNEX III

PART C

Test methods for the evaluation of the hazards for the aquatic environment

Normally, the classification of a preparation is made on the basis of the conventional method. However, for the determination of the acute aquatic toxicity, there may be cases for which it is appropriate to carry out tests on the preparation.

The result of these tests on the preparation may only modify the classification concerning acute aquatic toxicity which would have been obtained by the application of the conventional method

If such tests are chosen by the person responsible for the placing on the market, it must be ensured that the quality criteria of the test methods in Part C of Annex V to Directive 67/548/EEC have been complied with.

Furthermore, the tests shall be carried out on the three species in conformity with the criteria of Annex VI to Directive 67/548/EEC (algae, daphnia and fish), unless the highest hazard classification relating to acute aquatic toxicity has been assigned to the preparation after testing on one of the species.

VI. ANALYSIS OF SIMILARITIES AND DIFFERENCES

1. Scope: In Canada the classification of chemicals in consumer products and workplace chemicals are covered by different pieces of legislation. For the workplace physico-chemical properties and toxicological properties of the preparation are taken into account. For consumer products physico-chemical properties and only acute toxicogical hazards are taken into account. In the EU the classification of preparations is covered by a single piece of legislation, that can be applied across all product types and use categories defining clearly all end-points which need to be considered. Physico-chemical, toxicological and environmental properties are included. In the US chemicals in the workplace and in consumer products are covered by different pieces of legislation. Physico-chemical and toxicological properties are considered. Transport is covered by UN MRTDG in which physico-chemical properties and acute and corrosive effects are taken into account. Classification of pesticides is covered by separate legislation in Canada and the US, whereas in the EU it is proposed to be covered by the general legislation for preparations.

2. Exclusions/Exemptions: In Canada the exclusion of certain products under workplace regulations is under review. In the US similar exemptions are used. In addition waste and consumer products in their final form such as food or alcoholic beverages, drugs, cosmetics are also exempted. The US work place regulation has a set of exemptions for which other laws and regulations apply, for example, as in Canada, wood or wood products, manufactured articles, tobacco and tobacco products as well as medical/veterinary devices. In the EU similar exemptions apply to such products, which are governed by specific legislation. This extends in the EU also to medical devices.

3. Rationale: In the US, EU and Canada mixtures are classified for their hazards. Subsequently it is used to provide the information to workers, employers and consumers. In addition the classification is used in the EU for other purposes like restrictions for marketing and use to protect man and environment. In the US and Canada, some sectors (consumer products and pesticides) consider some elements of risk (exposure) to determine labelling requirements. The UNCETDG has a pragmatic approach to mixtures, which intends to allow the consignor to identify (without unnecessary difficulties or costs) the hazard characteristics of the mixture. Additional downstream consequences like prohibition/permission for transport and permitted packaging types and sizes can be expected.

4. For animal welfare reasons and available principles it is advocated in the EU, in cases when there are no requirements for testing, to use the standard approach for untested mixtures. Testing in order to assess the CMR hazards of mixtures is not allowed in the EU because of insufficient reliability of results.

5. Comparison of systems: The evaluation of reliable data for the mixture/preparation is used by all systems in order to classify the mixture/preparation. When one individual substance of the tested mixture/preparation is changed for another individual substance (for which the toxicity is known), all systems allow extrapolation of the test result. In the US, a standardised approach is only used for workplace chemicals. In Canada, a standardised approach is used for workplace and consumer chemicals. In the EU all kinds of preparations may be classified using the standardised approach. In the transport system a standardised approach may be used for acute toxicity.

6. When used for information purposes comparable general concentration limits in the range of 0.1% to 1% are used for safety data sheets in all systems.

7. The EU classification system allows for the determination of acute toxicity and corrosion/irritation of the non tested preparation the application of the dilution principle (extrapolation to lower hazards classes for these endpoints) in order to approach the comparable results obtained by testing.

8. For acute toxicity additivity rules are applied using a combination of all routes of exposure (EU) or one route only (Canada and the transport system).

9. In the EU a more severe general concentration limit is used for the highest hazard CMR classes than for the lowest hazard CMR class as compared to the US and Canada who have only one concentration cut-off.

10. For consumer products only acute health hazards are evaluated for hazard classification in Canada. In the US both acute and chronic health hazards are subjected to risk evaluation and a subsequent reduction in hazard labelling. In the EU however the consumer products are subject to the same classification procedures as for all other preparations placed on the market.

11. Where a specific concentration limit has been set for a substance this must be used in stead of the general limits in the standardised approach (EU). In the case of exceeding exposure levels in the workplace a hazard classification is also possible when a concentration less than the cut-off values is present for a certain component in a mixture (US).

12. The Expert Group on Classification Criteria for Mixtures held a one day workshop to illustrate conceptual, technical and practical differences between and existing systems and more importantly, to identify commonalties. A summary report of the Workshop will be provided separately.